Studies on Plato, Aristotle and Proclus

Ancient Mediterranean and Medieval Texts and Contexts

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Studies in Platonism, Neoplatonism, and the Platonic Tradition

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Studies on Plato, Aristotle and Proclus

Collected Essays on Ancient Philosophy of John J. Cleary

Edited by

John Dillon
Brendan O'Byrne
Fran O'Rourke

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τοῦτ’ ἀεὶ δραστέον διὰ βίου παντὶ κατὰ δύναμιν
(Plato, *Laws* 644b)

CONTENTS

Acknowledgments xi

John Cleary: A Philosophical Portrait xiii
Brendan O'Byrne

John Cleary: A Personal Memory xxiii
Fran O'Rourke

PAIDEIA

Back to the Texts Themselves 3
The *Paideia* of the Historical Protagoras 19
Competing Models of *Paideia* in Plato's *Gorgias* 37
Erotic *Paideia* in Plato's *Symposium* 53
Cultivating Intellectual Virtue in Plato's Philosopher-Rulers 73
Paideia in Plato's *Laws* 99
Socratic Influences on Aristotle's Ethical Inquiry 111
Akrasia and Moral Education in Aristotle 131

HISTORY OF MATHEMATICS

The Mathematical Cosmology of Plato's *Timaeus* 153
Abstracting Aristotle's Philosophy of Mathematics 181
Proclus' Philosophy of Mathematics 201

HISTORY OF PHILOSOPHY

A. *Plato*

Plato's Teleological Atomism 223
The Role of Theology in Plato's *Laws* 233
'Powers that Be': The Concept of Potency in Plato and Aristotle 251

B. *Aristotle*

On the Terminology of 'Abstraction' in Aristotle 301
Science, Universals, and Reality 333
Phainomena in Aristotle's Methodology 379
Aristotle's Criticism of Plato's Theory of Form Numbers 415
Aristotle's Criticism of Plato's First Principles 441
Should One Pray for Aristotle's Best *Polis*? 465
Emending Aristotle's Division of Theoretical Sciences 479

C. *Proclus and Later*

Proclus' Elaborate Defence of Platonic Ideas 515
Proclus as a Reader of Plato's *Timaeus* 525
The Rationality of the Real: Proclus and Hegel 543
Plato's *Philebus* as a Gadamerian Conversation? 565

Bibliographies 585
Index of Modern Authors 607

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'The Rationality of the Real: Proclus and Hegel' in *At the Heart of the Real: Philosophical Essays in Honour of the Most Reverend Desmond Connell, Archbishop of Dublin*, Fran O'Rourke (ed.), Dublin, 1991: 31–49.

'Plato's *Philebus* as a Gadamerian Conversation?': previously unpublished.

JOHN CLEARY: A PHILOSOPHICAL PORTRAIT

Brendan O'Byrne

On Easter Sunday, 12 April 2009, our friend and colleague John J. Cleary passed away in St Vincent's Hospital, Dublin, at the age of 59, in the course of an unsuccessful liver transplant. This was the culmination of a long and debilitating struggle with liver cancer, which he had undergone with heroic cheerfulness and optimism for the previous two years, almost since the sad death of his beloved wife, Breda, a blow which troubled him deeply. He was in fact already suffering from these problems in the run-up to our hosting of the Symposium of the International Plato Society in July 2007, but this did not prevent him from masterminding our preparation for the event, and keeping all the rest of us up to the mark with both humour and firmness. We are still mourning the loss of an unfailingly stimulating friend and colleague, a pillar of the Dublin Centre for the Study of the Platonic Tradition, and one of Ireland's most distinguished scholars of ancient philosophy.

John Cleary was born on June 18, 1949, the fourth child of John and Bridget Cleary, in Ballycroy, Co. Mayo, where his father farmed a small holding on the edge of the Atlantic. John attended the local national school, before attending St Mary's College Galway as a boarding student. With the intention of becoming a teacher he enrolled in 1967 in St Patrick's Training College in Dublin, graduating with a diploma in education in 1969. He followed this up with a B.A. in English and Philosophy from University College Dublin in 1972, and a Higher Diploma in Education in 1973 and two years later gained a first class honours M.A. for a dissertation on Karl Popper, all the while teaching primary school in Dublin. During this time he took an active part in theatrical and literary activities, something that, along with his experience of teaching young children, influenced his scholarly interests in later life, in particular his concern with ancient *paideia*. At this time also he met and married Breda Critchley, who shared his interests and became a major influence in his life.

In 1977, however, following an ambition to progress further, John left his secure job to undertake graduate studies in Philosophy at Boston University. After obtaining a doctorate in 1981, with the topic 'Aristotle's Theory of Abstraction: A Problem about the Mode of Being of Mathematical Objects', John joined the faculty of Boston College, where he remained for the rest of his life, rising to full professor, though in 1991 he accepted a joint position

back in Ireland at the National University of Ireland, Maynooth, where he subsequently taught for the second half of every year.

John's chief areas of scholarly interest in the field of ancient philosophy were in Aristotle, Neoplatonism (particularly Proclus), and the philosophy of mathematics, though in recent years he had developed a further major area of interest in ancient theories of education, and it is in these areas that his chief publications are to be found. Apart from a host of articles, his books were *Aristotle on the Many Senses of Priority* (Carbondale, 1988) and *Aristotle and Mathematics: Aporetic Method in Cosmology and Metaphysics* (Leiden, 1995). He also edited the proceedings of a most successful conference on Neoplatonism that he organised in Maynooth in 1995, as *The Perennial Tradition of Neoplatonism* (Leuven, 1997). Apart from his ancient interests, however, he was also an authority on the philosophies of Karl Popper, Hans-Georg Gadamer, and Alasdair MacIntyre (with each of whom he was on warm personal terms), and he wrote a number of articles on topics connected with them. Apart from his publications, John will be best known as the mastermind behind the Boston Area Colloquium in Ancient Philosophy (BACAP), for fully 25 years.

John Cleary's scholarly interests extended across the full spectrum of topics in ancient philosophy, from logic, mathematics, and metaphysics, right through to politics, ethics, and education. The present collection, which features a great many of his papers since the mid-1980s, is designed to reflect the broad range of his interests. When we turn to consider the sum of a scholarly career, we invariably seek out a unifying theme or central strand that harmonises a substantial and varied body of work such as is reproduced here. What is it that motivates the whole as a single project with so many aspects? What do such diverse and seemingly discrete topics as Aristotle's views on mathematics, and the role of education in the construction of the ideal society, have in common?

A clue to the unity of Cleary's interests can be found by briefly considering his emphasis on hermeneutics, which he believed would provide a better understanding of ancient philosophy than other methods currently employed in the area. Like his friend Hans-Georg Gadamer, John Cleary saw philosophy as essentially dialogical and open-ended, a conception that he claimed is crucial for understanding Plato's decision to write dramatic dialogues; this conception guided his own approach to the Platonic dialogues throughout.

There are at least three issues which played a major role in shaping Cleary's overall approach to Plato: the general problem involved in any act of interpretation, that is, the so-called hermeneutic circle; the status

of the dialogues as philosophical writing; and finally, the open-endedness of philosophy itself. In order to fully appreciate the scope and direction of Cleary's philosophical and scholarly project we ought to consider the degree to which the kind of hermeneutic theory and practice developed by Gadamer and others informed his work. Also, Gadamer's conception of hermeneutics fitted very well with Cleary's existing views on the role of education not just in the formation of rounded individuals (*paideia*, *Bildung*) but as a necessary condition for the development of the best possible society. Given the importance of educational theory and practice for Cleary's scholarly project, some discussion of hermeneutic theory and practice would be apposite before connecting these interests with his views about education.

Discussion of hermeneutic theory and practice over the last five decades has been largely dominated by the reception of Gadamer's magnum opus, *Truth and Method* (1960), and it would be difficult to overestimate the impact of this work on a range of disciplines within the humanities, directly or indirectly. Gadamer's central idea is that the basic activity of understanding is interpretation. Interpretation occurs in and through language as *conversation*. This amounts to a dialogical view of understanding which clearly has Socratic roots and would largely explain the special place that Plato's works held for Gadamer throughout his philosophical life. For Cleary too, this is why the dialogues of Plato occupy a privileged position within the philosophical tradition, they are 'exemplifications of philosophical activity, not only by the interlocutors who appear in them but also by the audiences, whether ancient or modern, who are invited to participate in the conversation by thinking through the problems raised and by testing any solutions for adequacy'. So on this view the seminar becomes a living extension of the kinds of conversations dramatised by Plato. This applies even to philosophical writing that is not presented in dialogue form; the text still functions as a dialogue partner, albeit one that initiates and guides the direction of the conversation. This can be readily seen in the way in which the highly successful Boston Area Colloquium, founded by Cleary in 1985, is conducted. Each paper would appear followed by a critical reply by an invited respondent. In this way the main paper acts as the basis for discussion prior to publication and, with its response, becomes a record of the seminar rather than a straightforward scholarly communication of the conventional and more monological kind.

We can begin to see why, for Cleary, Socratic dialogue epitomises the activity of the philosopher, and Plato's dialogues are taken as evidence of the view that truth is disclosed through language as the result of the ongoing activity of the discussants. Wresting the truth from a problem is a communal activity, and one that must be renewed and rediscovered in

and by each generation. This is an insight he shared with Gadamer, who held that the activity of understanding is a mutual process in which truth is uncovered in and through language and based, in part, on agreement. This presupposes another idea of originally Heideggerian provenance, via Gadamer, that language and understanding are world-disclosing. 'Language', as Heidegger famously remarked, 'is the house of being'. We might well compare these guiding insights with Socrates' stipulation that discussion can only proceed on the basis of agreement between the discussants and his related insistence that his interlocutor always say what he means, and finally, that the emergent *logos* is capable of showing something of how things really are, that words already name things, things of which we always have a basic understanding already. Socrates' interlocutors always show an approximate understanding or familiarity with the matters at hand, even if their specific understanding or account (*logos*), is shown to be conflicted or otherwise inadequate. The underlying idea is that philosophy is open-ended and therefore always underway as an activity, as opposed to a closed body of doctrine, such that any suggestion that we can achieve closure as a normative aim would be deeply misguided. For philosophy, according to Cleary, is 'a cooperative inquiry into fundamental and open questions … best conducted along the lines of a Platonic dialogue' ('The Price of Education': 2006). Behind this commitment to the open-endedness of philosophy lies the conviction that the intelligibility of the world 'always exceeds the capacity of any individual to comprehend it'. This would seem to mean that something of reality will always remain just beyond our grasp, itself a philosophical idea, and which Cleary maintained can be found in Plato. It has often been pointed out that if Plato were laying out his philosophy systematically, as if it were a body of doctrines, then the dialogue would be just about the worst form imaginable for that task. However, if Plato conceived of philosophy *itself* as dialogical and open-ended in the sense that closure (true wisdom and knowledge of the whole) is simply not possible for mortal human beings, then dramatic dialogue becomes the ideal form for portraying the human condition in respect of knowledge and wisdom. After all, philosophy is something that only mortals need engage in; the gods already repose in perfect wisdom.

In hermeneutic theory there are discussions about the importance of context, but not only the one from which the original texts are produced but also the ever-changing context of the tradition of reception. It is not only the obvious observation that the context in which we read Plato is different from, say, that of Schleiermacher, but the perhaps not so obvious point that the context of interpretation is largely shaped by the very texts

we are interpreting. Each generation must re-appropriate the content of the tradition for itself in reference to its own unique situation. This is rooted in Heidegger's idea of philosophy as something he regularly referred to as the *western metaphysical tradition*, an idea which again Gadamer inherits. Philosophy has at its base the texts of the ancient Greeks which, for as long as this tradition survives, will occupy a very special status. Therein lie not only the basic concepts and distinctions, but more importantly, perhaps, the selection and framing of the basic questions which determine the particular internal course of its development. The fundamental tenets of most, if not all, contemporary philosophical positions are anticipated by the Greeks, even if that provenance is not immediately perceived or acknowledged. For Cleary the concept of tradition played a crucial role. Tradition, he stressed, is not about treating canonical texts as if they were 'fixed and sacred', but is rather something dynamic, an 'on-going process of development and renewal' which, as he says, is not just the '"handing down" of the wisdom of the tribe from one generation to another, but also the active reinterpretation of that heritage by each new generation which inherits that tradition'. It is this conception just outlined, which deeply informed Cleary's views on education to which we now turn.

Throughout his career, first as school-teacher and later as university lecturer, John Cleary maintained a passionate devotion to teaching as a vocation, especially admirable in a time when so much of the emphasis seems to be on research and publication, with what is sometimes merely pious sloganeering in the direction of pedagogy. The importance of education coloured and informed all his scholarly activities and was thoroughly grounded in his own philosophical commitments, notably in his hermeneutic method, his understanding of tradition, and the lessons to be drawn from the ancient philosophers, chiefly, for example, the holistic nature of educational ideas discussed in the relevant dialogues of Plato. Education is at bottom an intrinsic part of philosophising such that it would be very difficult to abstract a 'theory of education' from the total philosophical context laid out in those dialogues. Cleary established himself as a foremost authority on mathematics in Aristotle and the Platonic tradition, but we should note that this interest was not driven solely by a predilection and talent for the subject, but also by a belief, central to the Platonic tradition, that mathematical education is a vital propaedeutic for initiation into the abstract domain of forms.

According to John Cleary, normatively speaking, education has a twofold importance: it shapes and prepares mature and cultivated people for real life in the complexities of contemporary western civilisation; and it preserves and renews that civilisation's core values and ideals via the form of

tradition, namely through the continuous development and preservation of academic disciplines. The former task is best served by the maintenance of the highest possible standards through the latter. The uncompromising attack on the directions currently imposed on academia by social, political and economic pressures, set out by John in 'The Price of Education' was motivated by a deep concern for the erosion of standards that were inevitable through such unwelcome developments as the politicisation of academic goals, the growing preponderance of corporate funding, the concomitant internalisation of corporate values, and grade-inflation. He saw that the latter two developments were rooted in a business culture which is pervading all areas of society as well as in a profound misunderstanding of the principle of equality. Universities are expected to project productivity norms, measured by grade averages and, of course, publication output. Students are cast in the curiously split role of customers/products and academic teaching staff as service providers. Lower grade averages in this environment somehow signifies failure, not so much in the students but in the producers who are issuing faulty product. According to Cleary, this mentality, if left unchecked, will destroy academic excellence. If that is the case, then the foundations of our civilisation will have been fatally undermined. He saw that standards must initially be nourished and encouraged at primary level and consolidated in the secondary, so that by tertiary level students will be prepared for the full rigours of a genuine discipline, rather than an ambiguous level of engagement in a process that inevitably results in a degree, as if by right.

This is the basic lesson that Cleary believed could be learned from the ancients, notably Plato: that a good society in significant part rests on a solid educational foundation. By implication, where those foundations are neglected or eroded, that society will enter into a process of dissolution. On the individual level, the products of the new grade-inflated industrial model will tend to produce 'bright young philistines', 'brash' and full of 'self-confidence', an unfortunate result. But submitting to the full demands of an academic discipline has the opposite moral outcome.

Cleary rejected the frequent association of tradition with cultural retardation and reactionary politics as a superficial view based on a misunderstanding of the true nature of tradition. Far from constituting an uncritical deference to authority, tradition involves not only a handing on of the repository of the accumulated wisdom of our past, but the 'active reinterpretation of that heritage by each new generation', in which sense much of contemporary philosophy would represent the current reworking of the tradition, the best of which will in turn be canonised, so to speak, thus becoming part of the repository of the tradition. The activity denoted by the term tradition

consists of three elements: content, critical reception, and reinterpretation. It is Cleary's views on the last element which we shall briefly mention, both for its primacy in sustaining the tradition but also in the practical and moral effects that submitting to the rigours of an academic discipline ought to bring about. The normative aim of education, particularly at the third level, is threefold—to prepare young people for a professional life which can contribute to the common good, to prepare the next generation of custodians of the tradition, and to cultivate certain virtues of character. The virtues which he lists as the result of submitting to the rigours of an academic discipline are: to develop patience in pursuing research, humility in the face of tradition, modesty in presenting one's results and willingness to accept criticism. These qualities are quite out of fashion in the current *Zeitgeist*. For this reason, an unyielding dedication to their preservation is required more than ever, and academics have a responsibility to resist any attempts to lower, or otherwise interfere with, the highest standards of pedagogy and research, and at the same time they have a duty to establish high standards and a right to expect students to meet them, no matter how unpopular this might prove to be these days.

We have emphasised John Cleary's views on education because his utter dedication to the work of the classroom and his fearless and tireless defence of the highest academic standards is crucial for understanding both the man and his work. His contribution to extending our understanding of ancient Greek education has been a constant feature of his published work from the start and is well represented in this collection, where we have included eight papers that bear on *paideia* and related ethical topics, ranging from the problem of *akrasia*, through the dispute over *paideia* portrayed in Plato's *Gorgias*, the educational theories of the historical Protagoras, to the primary importance of the theological foundations of any good polity as set forth in *Laws* X. His contributions to the illumination of theoretical themes in ancient philosophy are also well represented.

Cleary established himself as an authority on the place of mathematics in the philosophy of Aristotle and the later Platonic tradition, in particular Proclus. He took on some very difficult areas, notably in examining aspects of philosophical method and how these dovetail with familiar metaphysical issues, as, for example, in an important paper entitled 'On the Terminology of Abstraction in Aristotle' (1985) in which he challenges a long-standing orthodoxy that Aristotle had elaborated a theory of knowledge through a process of abstraction. He claims that there is more at stake here than just terminology, as the substantive issue bears on the methodological implications for Aristotle's metaphysical rejection of the separability of

forms and the theory of recollection. Abstraction turns out to be a logical procedure designed to clearly identify the proper subject of predication. He expanded upon these topics in 'Science, Universals, and Reality' (1987) and the monograph *Aristotle on the Many Senses of Priority* (1988). In the former, included in this collection, he again approaches the topic of universals and the nature of the proper object of science. Plato held that the form was the proper object of knowledge (*epistêmê*), but Aristotle rejects both recollection and separability; however, he joins with Plato in acknowledging that the sensible object cannot be an object of science. The resulting aporia spurs the development of a doctrine of universals beginning in *On Ideas* and the introduction of the 'common things' (*ta koina*), intended to take the place of Platonic forms. Cleary wants to explain the apparent problem shift that occurs by the time of the *Metaphysics*, where Aristotle sets out to resolve a tension between science and substance, revolving around their conflicting criteria of universality and particularity. Cleary revisits these and related themes in a series of papers from the early 2000s, notably in 'Abstracting Aristotle's Philosophy of Mathematics' (2002), 'Aristotle's Criticism of Plato's Theory of Form Numbers' (2002), and 'Proclus' Elaborate Defence of Platonic Ideas' (2002) which are included here.

We also saw fit to include a paper in which Cleary engages the work of one of the most important influences in his work, namely Hans-Georg Gadamer, with whom he maintained a long friendship. 'Back to the Texts Themselves' (2002) sheds light on the influence of Gadamer's hermeneutic theory and practice, particularly as it is applied to the study of ancient philosophy. It should be noted that Cleary emphasises a point that Gadamer made in the context of an anecdote about the latter which illustrates something essential about his conception of hermeneutics. The study of hermeneutic theory in itself is a hollow exercise if it is not carried out within a framework of practice. This consists of a close engagement with texts which must be forever mindful of the wider context. Not just the context of production, but of the tradition of reception and the philosophical situation of the interpreter. In a detailed reading of the origin and development of a central question for any serious reader of the *Timaeus*, 'Is the world created in time or is it eternal?', on which opinion has divided since the time of the Old Academy, this core dilemma arising very directly as a result of the hermeneutical problem created by the mode of presentation, Cleary works through the gap that opens up between Aristotle's insistence on taking the mythic narrative at face value and Xenocrates' adherence to a convention whereby mythic presentations are not to be taken literally. This points to the age-old question that the dialogue form poses for any interpreter: is it a vehicle for relatively well

developed philosophical doctrines, or does it serve to set out a series of open questions on a topic arising from a particular group of inquirers clustered around Plato? Cleary's agreement with Gadamer on the unity of hermeneutic theory and practice is perhaps nowhere better seen than in the context of a reading of one of the most difficult texts in the *corpus Platonicum*, a task he accomplishes in exemplary fashion.

This introduction to the contents of this volume has aimed at an exposition of the key ideas underlying John Cleary's scholarly work rather than at a detailed account of each of the papers contained in this collection. What the editors hope will be revealed in this collection is something of the mind and work of a remarkable man, whose premature passing has been a deeply-felt loss to both the scholarly and social life of Ireland, as well as the wider philosophical world.

JOHN CLEARY: A PERSONAL MEMORY

Fran O'Rourke

Of all John Cleary's philosophical colleagues I am honoured to say that I knew him the longest—since 1963 (fifty years ago), when I started secondary school at St Mary's College in Galway. John was a year ahead, but through his younger brother Michael, with whom I shared a desk, I came to know John better than one would normally a student from a higher class. John stood out from the generality of the student body, both through his academic brilliance and attractive personality. My salient memory is of a happy, hard-working and independent-minded country lad, marked by an unbending sense of fairness; he took no nonsense and was unfailingly loyal to his friends. Tall and physically robust, he excelled on the sportsfield, securing a coveted place on the senior Gaelic football team, an achievement that in the real order of things rivalled academic success.

After secondary school I lost contact with John. He studied in Dublin before moving to Boston; I studied in Galway and later on the Continent, before joining the staff at University College Dublin. There I caught up on John's very active career through my dear colleague and John's close friend Colm Connellan, who had encouraged him from his early days at UCD. When John returned to a position at Maynooth our schooltime acquaintance deepened into a lasting friendship. Our backgrounds were in many ways similar and we had much in common. We had both grown up in the countryside during the humble fifties in days before electricity and running water. Our education followed a vaguely parallel pattern. We had each enjoyed the benefits of a small rural two-teacher school. We later learned Greek and Latin from the same dedicated teachers at St Mary's Galway, something that would decisively determine our respective careers. John did his postgraduate studies in Boston, I took a circuitous route through Vienna to Leuven, with sojourns in Köln and Munich; I would later visit the USA, and John spent his sabbatical semesters in Germany. Our crossing paths and shared love of travel, usually for reasons of philosophical research, provided much material for conversation.

Similar backgrounds, experiences and interests, mutual friends and colleagues in Ireland and around the world, formed a solid ground for friendship. With John there was never a boring instant, whether discussion was of

politics, sport, education, philosophy, food and wine, theatre, religion, travel, or our mutual acquaintances. John was always interesting and interested. Of no topic could he say: 'I'm not interested'—an open attitude which should be the mark of every actively intelligent individual, and certainly of the true university person. John had a devilish sense of humour that pierced the nonsense of those who took themselves too seriously; he certainly did not suffer fools gladly (especially those of the philosophical class) and took delight in deflating anyone he suspected of pomposity. He used to say that the academic world was full of people who were equally intelligent and arrogant; he was nonetheless charitable in all his dealings. He was never one to gossip and always wished well to everyone, including those with whom he did not see entirely eye to eye. He unfailingly displayed the highest standards of personal integrity.

The value, method and purpose of education—original Greek *paideia*—were questions of habitual concern for John; it was part of his professional formation and became ingrained in his personal and philosophical outlook. According to the folklore of the Cleary family, some of John's ancestors were hedge-school masters, outlaw teachers who in earlier centuries secretly educated native Irish pupils at risk to their own lives. Most famous of the traditional Cleary clan was the scribe Mícheál Ó Cléirigh, chief among the Four Masters, who in the sixteenth century compiled the Annals of the Kingdom of Ireland. John was vitally conscious of the noble tradition of Irish education and with honest pride would point out that he had been a primary teacher for almost a decade. This was an experience which deeply marked him and allowed him to better understand the formative-educative character of the Platonic dialogue, as well as the (Gadamerian) idea of self-education (also focused on an interpretation of Plato's dialogic way of doing philosophy). John was himself always eager to learn from other disciplines and to promote the wider relevance and value of philosophy across the university. He encouraged trans-disciplinary dialogue and cooperation. In particular he voluntarily contributed thought-provoking philosophical modules to programmes of study in mathematics and science.

In his own life John put the ideals of ancient *paideia* into concrete practice. He excelled as a teacher, showing the same genuine interest in the pupils of his Dublin primary school as in his postgraduate students of Boston and Maynooth. His caring nature moved him to take a wheelchair-bound pupil into his class, despite the lack of facilities in the school at the time. In a move well ahead of the times, he looked after the child with care and diligence though the school was not especially equipped to accommodate wheelchairs, a fact which is greatly appreciated by the child's family to this day. On a later

occasion he challenged one of his American postgraduates, whose future ambitions pointed vaguely, but aimlessly, towards a financially rewarding future: 'Why don't you do something useful and become a teacher?' The student re-evaluated his life's purpose and is to this day grateful for John's disruptive encouragement.

John consciously treated his students as he would his professional peers, expecting from them the same philosophic rigour, and according them the same respect. He showed keen concern to cultivate genuine questioning among undergraduates through the practice of renewed dialogue; he encouraged in them a spirit of independent inquiry and valued their judgment. His postgraduate student and close friend Susan Bencomo wrote: 'John enjoyed arguing and working out philosophical arguments for the pleasure of learning; he had genuine respect for his interlocutors of all ages and training and was never condescending towards the apprentice. He never demanded that students follow him or agree with him. I think he embodied the true spirit of teaching, which is to cultivate a confident lover of learning, because his respect for students and peers alike was always as his equal.' John, I believe, was an excellent teacher of philosophy because with intelligence he combined modesty and simplicity, which in his case were never false. His 'ignorance' was not a pretended or methodic pretext, but a driving impetus; he truly enjoyed discovering something new, something he had not imagined or understood on a specific topic. He permanently promoted polite, generous, and honest dialogue, emulating the Platonic dialogue that he admired so much. He was an inquisitive spirit, or as he preferred to say, a 'troublemaker'. He displayed the same honesty with both students and colleagues. In debate he was a formidable discussant and, as he said himself, took no prisoners.

While John did not take himself seriously he regarded his duties as philosopher and teacher as a matter of the highest commitment. He was never one to be deflected from the target of investigation; there was even a self-humoured stubbornness in his approach, which he occasionally and consciously tested upon his colleagues. Alasdair MacIntyre aptly conveyed John's philosophical engagement: 'John Cleary was my student thirty years ago at Boston University and my friend ever since. He was always the one to ask the difficult question, the question that took you uncomfortably close to the heart of the matter, the question that was uncomfortable because it took you where you were not yet quite prepared to go. As a student, he both learned from and educated his teachers, John Findlay, Hans-Georg Gadamer, and myself. As a teacher, he taught his students how to be curious, how to be puzzled. As a friend, his wit and his cheerful honesty made conversation immensely rewarding.' Besides MacIntyre, Findlay, and Gadamer, with whom

he was on very close personal terms, John had as a young scholar gained the admiration and affection of Karl Popper, who consciously broke down the boundaries of formality. 'Dear John, please drop the Sir, my name is Karl', he wrote in an early exchange. While John was a regular houseguest of the great Austrian thinker, spending weekends at his English residence, he refused to play the acolyte and later scandalized some devotees by publicly questioning Popper's philosophical positions at an international conference in honour of the master.

By his mid-fifties, John had by any standard accomplished a remarkable body of work. He had established himself as a leading international expert in classical philosophy, especially in the work of Plato, Aristotle and Proclus. Years of solid research yielded what will be his lasting and monumental opus, a mammoth monograph (almost six hundred pages) on Aristotle and mathematics. One of John's greatest victories of rhetorical persuasion, betrayed in the telling by a mischievous chuckle, was to convince Brill's senior editor that the topic needed a volume of such magnitude. He also penned scores of authoritative articles, of which only a selection are included in the present volume. The twenty-five volumes of the Boston Area Colloquium in Ancient Philosophy, as well as other important volumes, proceedings, *Festschriften*, and collections, could in their own right stand as a respectable lifetime contribution to scholarship. Quite apart from his published work, one of John's strengths was the practical genius and determination with which he organised colloquia, conferences and other activities which are nowadays an important part of academic philosophical exchange. One of his American colleagues once remarked to me that John was a great ally in any enterprise: obstacles were confronted head-on and straightened out, all paths were made clear. We in Dublin could observe this as we benefited from his energy and skills before and during the International Plato Conference. Among his peers John achieved academic recognition on both sides of the Atlantic, with simultaneous professorships at Boston College and the National University of Ireland, Maynooth. Approval from Ireland's wider academic community soon followed with his election to the Royal Irish Academy. Further international recognition came with the award of a prestigious von Humboldt Fellowship which enabled him to pursue research with Hans-Georg Gadamer in Heidelberg, and with Werner Beierwaltes in Munich.

John was contented and fulfilled; he had the measure of the world and was happy to be in it. He had mastered a mature confidence and attained a deep conviction of what was right, and of those values to which he was committed. He was devoted in the first place to his darling wife, Breda, who was a power

of nature in her own right: immensely proud of her husband, she boasted of his achievements more than he was aware. Next in John's order of priorities was a commitment to the human ideals of ancient philosophy as a timeless guide for the good life. The motivation for his varied activities was not just academic; philosophical activity should naturally overflow into the praxis of education, and ultimately influence wider communal and personal living. It is in this larger context that we should appreciate John's major project to make relevant the insights and values of Greek *paideia*; happily some of his results are included in this volume. John carried out his philosophic activity at the cutting edge, engaging in the latest debates of the international philosophical community. At the front line of his research, however, were the activities of the Dublin Centre for Platonic Studies, founded by his treasured friend, the eminent scholar John Dillon. Here he was at his undisguised best, generously exemplifying the virtues of collaborative inquiry and debate. My clearest memories of John are of his laughing face (still youthful as he approached his sixtieth birthday), in an open collar and red jumper, as he set out to walk home to Rathgar—'only a bit of a stroll'—from the city centre after one of those convivial gatherings that always followed our seminars on ancient philosophy.

At the acme of his philosophical career, with everything in his favour personally and professionally, full of the joys of life, actively engaged in the philosophical communities of the greater Dublin and Boston areas, John was dealt within a few short years one harsh blow after another. First there were alarming signs of his own ill-health, then his wife Breda, the light and spirit of his life, was unexpectedly diagnosed with cancer. He looked after her with loving care during her illness and suffered greatly upon her death. As in everything else, John preferred to confront his grief directly, rather than be distracted by the diversions that his kind friends understandably offered. In less than three years he himself received the devastating news of his own cancer. For six months he was hospitalised and underwent a punishing battery of tests to verify if he would be a suitable transplant candidate. He showed immense fortitude and bravely bore his perilous condition; he never complained, but maintained a spirit of Stoic equanimity. He even took delight in the shocked embarrassment of his friends unprepared for dashes of macabre humour concerning his condition. During his long stay in hospital John was faithfully visited by the members of his own and Breda's family, and by some special long-time friends. Especially loyal and dedicated to him throughout this testing period were his good friend Tony Sweeney, a classmate from the teacher training college, as well as Tony's wife Catherine and daughters Aideen and Eimear. Donal Regan, another long-time friend,

and his wife Sorcha were almost daily visitors and showed him many practical kindnesses. John drew solace and support from the visits of these and other faithful friends.

The last time I saw John was during the Dublin conference celebrating Alasdair MacIntyre's eightieth birthday. He was in splendid form and preserved intact his reputation for always asking the first question after a session. Few were aware that at every moment he was on the alert for a call from the hospital, should a suitable donor organ become available. He spoke at the conference banquet and regaled his audience with hilarious anecdotes from his time as Professor MacIntyre's assistant. We cherish these last memories. On Holy Thursday he texted his friends to say that a suitable donor had been identified, and that he would soon undergo a transplant. 'Halleluia, rejoice with me!' he wrote. Sadly the expectant joy was short lived, and painfully we recall the heart-searing news of John's passing in the early hours of Easter Sunday 2009.

In his homily at John's requiem Mass Fr Brendan Purcell, who visited John weekly during his long months in hospital, spoke fittingly of John's two passions in life: the search for truth and 'his soaring commitment to love, especially the love of his dear Breda'. Professor Purcell remarked: 'Like doubting Thomas, he was always searching for a living contact with the truth. Right up to the very end of his life, he was seeking that truth, very like Jesus' last Why?, when he cried out 'My God, my God, why have you forsaken me?' And as with Jesus, John's was a Why-without-an-answer. Yet his Why had a big dose of acceptance, not at all far from Jesus' "into your hands I commend my spirit."'

It was an unforgettable occasion as John's friends gathered at the graveside in the midland town of Portlaoise (less than a mile, incidentally, from where I was born). In a moment of mild drama his close friend and colleague Fr William Richardson arrived just in time to read a letter of tribute and condolence from the Head of the Department of Philosophy at Boston College. In his message Professor Byrne recalled: 'John joined our Department in 1981, fresh out of his doctoral studies at our neighbour and sometimes rival institution, Boston University. I was myself a very junior faculty member at that time, and I remember well how John's energy and humour could fill up a room. He seemed to know everything—from ancient Greek philosophy to contemporary German philosophy (especially the work of his mentor, Hans-Georg Gadamer) to contemporary philosophy of science and mathematics. And he gave generously to our department, offering for our students over the years a remarkably wide range of course subjects. His learning, enthusiasm and generosity profoundly enriched the experiences of our students.'

In the days and weeks after John's death I was amazed at the spontaneous tributes that circulated among his friends across the globe. It was yet further proof, though none was needed, of John's passion and gift for friendship, something he greatly treasured and cultivated. He was truly devoted and loyal to his many friends in many countries and faithfully maintained regular contact. As one example of many I quote from Marcelo D. Boeri of Universidad Alberto Hurtado, Chile, who had a long telephone conversation with him some days before his operation: 'I was most fortunate to be his friend and to know other aspects of his magnetic personality. John gathered in himself many remarkable qualities, not only intellectual but also "human" in its strictest sense. To put it in Aristotelian terms, he had both the intellectual and moral virtues. This is a very unusual conjunction of factors that can be found in few people, which makes his departure all the more painful to many of us. This is also one of the reasons why for me (and certainly for all those people who got to know him at the more personal level) his absence has left a great gap … I would like to bear witness to John's enviable courage and serenity before the end that proved inexorable. Despite the fact that he was totally aware that his own condition was extremely delicate and fragile, he never lost his optimism and faith in life, and continued to make plans with confidence in the future. There may be a sense in which John lost the battle: death most brutally annihilates our projects in the physical sense. There is another sense, though, in which it can be said that John won the struggle: his fighting spirit throughout adversity, his extraordinary courage, his goodness, and professionalism will continue to be an inspiration for all those who got to know him beyond his purely academic character.' His close colleague at Boston College Arthur Madigan SJ, with whom John shared a common interest in ancient philosophy, remarked: 'What stands out most clearly is his inexhaustible energy, his physical, moral, intellectual vitality. Also his wonderful capacity for friendship and colleagueship.'

In conclusion I recall the remark of John's close friend Vasileios Kyrkos of Athens, whose sorrow at John's passing was lightened by the thought that throughout his long trials John himself received solace and encouragement from the *Consolatio* of Philosophy. John was an exceptional human being and an outstanding philosopher; we should take consolation from the lasting joy that springs from good friendship.

PAIDEIA

BACK TO THE TEXTS THEMSELVES

Quidquid recipitur ad modum recipientis recipitur

Introduction

As most people will recognise, my title echoes Husserl's famous clarion cry of phenomenology as a programme for returning to the appearances of things without considering their metaphysical status. The point of echoing such a call here is to remind those who talk abstractly about hermeneutics that texts are the primary objects of the discipline. This may seem to be such an obvious point that it could not possibly be overlooked, but there is some evidence to the contrary. For instance, the secondary literature is full of talk about hermeneutical method as if this were some kind of theoretical construction, when in fact it is primarily the practice of reading texts, combined with methodological reflection. This is the point of Gadamer's favourite story in which he tells of meeting young students who declare that they are studying hermeneutics, and of asking them: 'And what else are you studying?' Of course, such an oversight could hardly be attributed to accomplished scholars who discuss the topic of philosophical hermeneutics and Greek philosophy. So, in deference to my colleagues, I will merely try to clarify the challenge that Greek philosophical texts constitute for the discipline of hermeneutics. To keep my discussion as concrete as possible, I will illustrate my remarks with references to Plato's *Timaeus*, which is one of the dialogues with the longest history of competing interpretations, beginning within the Old Academy itself.

I. *Different Traditions of Interpretation*

In a recent paper on the topic of reading Plato correctly, Christopher Rowe (1992) argues against Derrida's hermeneutics of suspicion on the grounds that it constitutes an attempt to rule out the possibility of discovering the best reading of any literary or philosophical text. By contrast, Rowe makes the following claims: (1) that there is something which a Platonic dialogue actually means, and (2) that it is possible for us to recover this, and

thereby give a superior interpretation of a 'classical' text. These claims rest on his explicit hermeneutical assumption that such a text is coherent as a whole, so that the parts can be interpreted with reference to the whole.
[2] Another of Rowe's explicit assumptions is that Plato directed his dialogues at | particular audiences, so that we should not be surprised if he says different or even conflicting things about the same topic in distinct works. These hermeneutical assumptions imply for Rowe that, even if we cannot establish precisely what Plato believed in, we can find some good indications as to what he holds dear. With respect to the *Timaeus*, for instance, one can establish a metaphorical interpretation of key doctrines from hints in the text itself.[1]

In his deservedly famous commentary on the *Timaeus*, F.M. Cornford (1937) insists upon the poetic character of its narrative which tells a likely cosmogonical story akin to that in Hesiod's *Theogony* or in Parmenides' poem under the so-called 'Way of Opinion'. If this is the right hermeneutical perspective from which to read the dialogue, then its 'likely story' should not be read as if it were literally true. For instance, Cornford (32) thinks that Plato's account of the activities of the Demiurge contains an irreducible element of poetry that resists translation into scientific prose. Yet he thinks that the poetic narrative about a Demiurge constructing an ordered universe out of an initial chaos does contain a deeper truth about the visible universe, namely, that it is the product of intelligent design rather than the result of mere chance, as some Presocratic thinkers had held. So Cornford concludes that we cannot take literally Plato's story of a cosmic craftsman constructing the universe in a temporal fashion analogous to the human production of an artifact.

On the other hand, Tom Robinson (1970 & 1987) has drawn on hints in the *Timaeus* to spell out a literal interpretation of these doctrines, especially the claim that the world had a temporal beginning though it continues in existence sempiternally. As 'a sound principle of interpretation', he suggests that what Timaeus says is to be understood literally except where he explicitly indicates that he is not to be so taken (e.g. *Tim*. 34b–c). On this basis he proceeds to offer a literal interpretation of the theodicy of the *Timaeus*, which involves the Demiurge as the efficient cause of a contingent though unique visible universe. In the light of his interpretation, Robinson excises ἀεί from the text at 27d6–28a1 even though it has been accepted by almost

[1] This opinion is not expressed as a conclusion in Rowe's published paper, but rather was given on an earlier occasion (November 1990, Dublin) in answer to my question about the implications of his hermeneutical principles for our interpretation of the *Timaeus*.

all modern editors. This is the sort of emendation that John Dillon (1989) has called 'ideological' because it is motivated by some general interpretation of the whole meaning of the text, which dictates in turn how the part is to be read. Here we have a beautiful example of the dynamic interaction between whole and part, which is a basic theme of Gadamer's hermeneutical reflections. It also illustrates the need for a return to the texts themselves, so that we may better understand the practice that grounds hermeneutics.

For me it seems to be no accident that the modern dispute between those who propose literal and metaphorical interpretations of the *Timaeus* mirrors the ancient dispute between Aristotle and Xenocrates within the Academy. This recurrence illustrates the influence exercised by interpretations that have some | powerful ideological motive for reading a classical text in one [3] way rather than another. In the history of interpretations of classical texts, such an ideological bias is more visible in the case of the *Timaeus* than most other texts. For instance, if we review the late Hellenistic and early medieval interpretations of the dialogue, we find conflicting ideologies at work in the commentary of the pagan philosopher, Proclus,[2] as against the early Christian view of it as a 'creation story'.[3] Similarly, in the Renaissance readings of the *Timaeus*, we find quite a different set of motives at work in the interpretations offered by Nicholas of Cusa and Galileo. With the benefit of hindsight, it is very tempting for modern scholars like Tigerstedt (who pride themselves on having no ideological axe to grind) to correct such interpretations in the light of what Plato actually meant to say.[4] But the original dispute between Aristotle and Xenocrates suggests that a residual ambiguity surrounded key passages in the *Timaeus* from its first reception,

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[2] Coulter (1976) has shown how Proclus' allegorical interpretation of the *Timaeus* is influenced by the Neoplatonist assumption that behind the appearances of the text there lie ideal meanings which the author intended, and which the interpreter must bring out.

[3] As an indication of such ideological influences on late Greek commentary, we might study the work of John Philoponus called *Against Aristotle on the Eternity of the World*, which has a direct bearing on my topic. Baltes (1976) has made an excellent historical study of the different ancient interpretations of Plato's ambiguous claims about the 'generation' of the sensible universe.

[4] Tigerstedt (1977) has shown how scholars in the last two centuries have given quite different interpretations of Plato, shaped by their own unconscious prejudices about what a great philosopher ought to say and how he ought to say it. But Tigerstedt himself falls into a different trap by claiming (88) that 'scholars with no philosophic axe to grind can understand Plato better than Aristotle and Plotinus because they are not great philosophers defending their doctrines against Plato or attributing them to him.' In spite of his excellent survey of Plato interpretations, therefore, it is clear that Tigerstedt failed to understand the basic hermeneutical situation of every interpreter, as described accurately by Gadamer.

and this should bring us back to the text itself with questions about how its literary form and the philosophical content conspired to produce such uncertainty about its central claims.

II. *Form and Content in the* Timaeus

If one views the *Timaeus* through the eyes of Aristotle, who offers trenchant criticisms of the dialogue in his own inquiry about the heavens, it appears to be a treatise on cosmology. Despite its not having the literary form of a treatise, this is to treat the *Timaeus* as a prototype for Aristotle's *De Caelo*, and to see Plato as anticipating some of Aristotle's doctrines, especially his teleological view of the universe.[5] Thus Aristotle constructs a teleological world system that is heavily indebted to Plato, even while making a new departure with his biological conception of final causality. In the light of these shared assumptions, one can clarify some important differences between the two thinkers, especially with regard to the role of mathematics in their respective cosmologies.

In relation to previous traditions of inquiry, the so-called 'works of Reason' involve Plato's appropriation of a type of Pythagorean cosmology that was dominated by the search for abstract numerical relations as the principles of order. Similarly, for the so-called 'things that happen of Necessity', he adopts the concrete physical approach of the *physiologoi* as exemplified by Empedocles and Anaxagoras. I think, however, that Plato transcends all of these world-views by integrating them into a cosmology that is guided by mathematical and teleological principles. My interpretive approach to the dialogue, therefore, is to take it as pursuing a dialectical strategy according to which conflicting opinions are reviewed in the search for principles that are adequate to 'save the phenomena'. This is consistent with its narrative structure in which a Pythagorean from Sicily tells a 'likely story' that combines
[4] elements from both the mathematical and the natural philosophical | traditions.

In the dialogue bearing his name, Timaeus undertakes to speak first about the origin of the cosmos and then about the generation of mankind. Although traditionally identified as a Pythagorean, this historically obscure person might also be taken as a fictional synthesiser of older cosmological

[5] Vlastos (1975: 30 & 62) notes that Aristotle's cosmological system consolidated the teleological methodology championed by Plato. What needs to be spelled out in more detail, however, are the precise differences between their conceptions of teleological causes.

theories.[6] For this approach to cosmology, Plato may have found a precedent in Parmenides' so-called 'Way of Opinion', which seems to borrow the terminology of opposites from Ionian natural philosophers while offering an alternative account of the sensible universe that is held to be no less plausible.[7] Although the discourse of the *Timaeus* is more didactic than dialogical, one cannot assume that Timaeus is simply Plato's mouthpiece, since its narrative form conceals the author just as effectively as ordinary dialogue forms. Indeed, Gadamer[8] has argued convincingly that, if we are to understand this dialogue, we must listen for changes of tone and shifts in its mode of discourse. For instance, the solemn manner of the proem underlines as genuinely Platonic the initial distinction (guiding the subsequent discussion of the realm of Reason) between that which is always Being and has no Becoming, and that which is (always) Becoming.[9] The first is grasped by thought with the aid of reasoning because it is always unchangeably real. By contrast, the second is an object of belief which is grasped by opinion with the help of unreasoning sensation because it becomes and perishes but is never really real.[10]

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[6] My approach should not be confused with that of Taylor (1928) who thinks that Timaeus actually represents a historical figure like Philolaus, who is given a fictitious set of views from which Plato distanced himself. Cornford (1937: x) rightly objects that no ancient commentator even hints at such a possibility, but that all follow Aristotle in treating the *Timaeus* dialogue as representing the views of Plato. But this does not rule out the possibility that Plato gives a likely account which imitates the contrasting types of Presocratic cosmology which are reconciled in his own synthesis.

[7] Cf. Parmenides, Fr. 1, 28–32 & Fr. 8, 50–51, Kirk & Raven: 254; also Plutarch, *adv. Colotem* II 14B (DK 28B10).

[8] Cf. Gadamer 1980: 156–193. For instance, he differentiates between the mythical narrative for the realm of Reason and the almost technical discourse for the realm of Necessity, and on this basis argues that the Demiurge is not responsible for the mathematical pre-structuring of the Receptacle.

[9] It has been suggested by Whittaker (1969: 181–185) that the second line be excised because it has poor MSS authority. This suggestion has recently been revived by Robinson 1987 in support of his literal interpretation of the dialogue. But Dillon (1989: 63) points out that the second ἀεί did not bother the Christian Aristotelian, John Philoponus, who took it as a reference to the state of constant dependence of a created universe. So its philosophical implications are not clear or decisive either way, and one could argue for its retention on stylistic grounds as being needed for the balance of a sentence which perhaps plays on the ambiguity between 'continuously' and 'continually' as meanings of ἀεί.

[10] When Timaeus adds the qualification 'in my view', this may indicate that he is being treated here as a mouthpiece for Plato himself, since this cannot have been the view of Pythagoreans who (according to Aristotle) naively identified the being of number with the being of reality as a whole. The cosmology presented cannot be a simple Pythagorean one because that has been superseded by a more sophisticated Platonic view that distinguishes the object of reason from the object of belief and sensation; see *Met.* 987b29–34.

Timaeus' subsequent elaboration of the realm of Reason is guided by this ontological and epistemological distinction until its explicit amendment with reference to the things generated by Necessity. Thus, he argues, the existence of a whole class of things that are generated requires the agency of some cause without which it is impossible for any generated thing even to come into existence. This is the argument that licenses the Demiurge as an active agent in Plato's cosmology but not as an omnipotent creator.[11] For one thing, Timaeus insists that the Artificer must keep his gaze fixed on an eternal and unchanging model in order that the generated object be beautiful. For if the craftsman were to use a generated model for his work, the end result would not be beautiful. The Idea of Beauty here functions as a cosmological principle for the Demiurge in his ordering of the visible world.[12]

By way of answer to what is described as the primary question, Timaeus declares (*Tim.* 28b3 ff.) that the whole Heaven has been generated because it is visible and tangible and possessed of a body.[13] All such things are sensible and are therefore generated, since they are grasped by opinion with the help of the senses. We can see how the guiding distinction functions here as a criterion for deciding to which ontological realm any object will belong.[14]

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[11] Gregory Vlastos (1975: 26 ff.) talks about the Demiurge as a 'creator' of the cosmos but clearly he does not mean that there is creation *ex nihilo*, since he recognises the existence of a primordial chaos. In a personal communication, the late Prof. Vlastos defended his talk of a 'creator' by drawing the analogy with Michelangelo as the creator of a sculpture, and I accept that such an analogy is appropriate for the *Timaeus*.

[12] The precise relationship between the Demiurge and the Form of Beauty remains rather obscure but the text implies that they are two distinct entities, one of which guides the ordering activity of the other. If one accepts G.E.L. Owen's suggestion (1953) about an early date for the *Timaeus*, in proximity to the *Republic*, one could refer to the cosmic craftsman at 596b, though he is made responsible also for making the original model of the bed. However, if one accepts the stylistic evidence of Ledger (1989) for a very late dating of the *Timaeus*, one might look for parallels to the *Philebus* where the Good shows itself in the Beautiful, both of which are guiding principles for right action and for ordered construction in the *polis* and in the *kosmos*.

[13] Robinson (1987: 119) thinks this argument may involve a category mistake, since the universe is not like any ordinary sensible object that may be perceived by the senses and categorised as a whole. Such a Kantian criticism might be legitimate as an objection against Plato if he were consciously rejecting the Atomist distinction between 'universe' and 'cosmos' when he lists them as synonyms here.

[14] Despite the dismissive altitude of Cherniss (1944 & 1945), we might find here some basis for Aristotle's report that Plato posited mathematical objects as an intermediate class of entities; see Annas 1975a: 146–165. Perhaps it is significant that the 'materials' out of which the world-soul is constructed are described as 'in the middle' between eternal and generated Being, since the souls of mortals are constructed out of a similar (though less pure) mixture of intermediate Sameness, Otherness and Being; cf. *Tim.* 35a–b, 41d. Thus, on the principle of like to like, human souls can grasp the intelligible mathematical structure of

Having accepted the Cosmos as a generated thing, Timaeus claims that there must be some cause of its generation. But here he seems to balk; first, at the task of discovering the Maker and Father of | this universe and, secondly, [5] at the prospect of trying to explain this to all men. It is not clear from the passage whether Timaeus intends to undertake either project, though he does say that it would be impossible to explain the cause of the universe to all men.[15] Yet that still leaves open the possibility of its being intelligible to a mathematician.

At this point, however, Timaeus returns again to a crucial question about the universe, namely, whether its Architect copied from a model which is self-identical and uniform, or from one which is itself generated. On grounds of piety, it is argued that the Architect of the universe must have fixed his gaze upon an eternal model, but what is even more decisive is that the Cosmos is beautiful and that its Architect is good.[16] It is held to be obvious that his gaze was upon what is eternal because the Demiurge is 'the best of all the causes' and his constructed Cosmos is 'the most beautiful of all generated things'. So Timaeus concludes (*Tim.* 29a) that the generated universe must have been constructed as a copy of the eternal model, which itself is grasped by discourse and reasoning and which remains self-identically the same.[17] This conclusion confirms the ascendancy of reason (as insight into intelligible purpose) in Plato's attempt to understand and explain the visible universe.

Timaeus completes his introduction with a methodological digression (29bd) in which he stresses the importance of starting every discussion

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the cosmos. Such correspondences may have prompted Speusippus to describe the world soul as a mathematical substance, since it would fit with his interpretation of Timaeus' account of 'generation' as a metaphorical description that was given for the sake of theoretical understanding (τοῦ θεωρεῖν ἕνεκεν).

[15] Vlastos (1975: 25) claims that the ordering activity of the Demiurge is 'supernatural' and therefore does not fall under the class of events that can be given a natural explanation. While this may be true enough, it does not exclude the possibility that such activity may be understood in terms of the mathematical construction which Timaeus subsequently introduces, possibly by way of explanation.

[16] It is noteworthy that Plato's description of the Demiurge as 'lacking in envy' reflects his opposition to the old mythopoetic tradition about the gods. On the question about the rationality of the universe, Plato is firmly on the side of the Ionian *physiologoi*, even though he staunchly opposes them on other questions; see Vlastos 1975: 27 ff.

[17] These analogous structures at the sensible and intelligible levels, which are paralleled by the analogy between man as a microcosm and the universe as a macrocosm, provide fertile ground for the later allegorical interpretations of the *Timaeus* offered by Neoplatonists like Proclus. If my thesis is correct, then the seeds for such elaborate interpretations were sown already in the early Academy by people like Xenocrates who offered metaphorical readings of some ambiguous passages in the dialogue.

at its natural beginning.[18] The 'beginning' which Timaeus makes here in connection with the model and its image is to affirm that the accounts given of each will be akin to the different objects that they serve to explain. In other words, when dealing with objects that are permanent and that are grasped by reason, one should give an account that is itself rational and also permanent, insofar as it is fitting for such accounts to be unchanging and irrefutable. This principle of correlation between ontology and epistemology also dictates that a likely story is most appropriate for the visible universe, since it is a copy of an eternal model. Behind such a principle lies the idea of mathematical proportion also, which was inherited from the Pythagorean tradition.[19] We see this idea brought out explicitly in the analogy which Timaeus draws (29c3–4) between the two realms: just as Being is to Becoming, so also is Truth to Belief. Such a proportion reminds one of the Divided Line metaphor in the *Republic* which also compares the realms of Truth and Belief in terms of mathematical proportion. In fact, both comparisons may be seen within the broader context of the Pythagorean theory of proportion.

Thus Timaeus proposes to give a plausible account of the origin and development of the visible world, within which he later (*Tim.* 47e3 ff.) distinguishes between 'the works of Reason' and 'what comes about of Necessity'. So the general plan of his discourse is first to analyse the works of Reason, then the products of Necessity and, finally, to describe their
[6] cooperation in the generation of | mankind.[20] It seems clear that the so-called 'works of Reason' are those aspects of the visible world, especially of the heavens, that show a rational and intelligible plan. By contrast, those things that are generated through Necessity seem to happen largely as a result of chance. Subsequently in the dialogue (45a–47e, 69e ff.), Timaeus tries to reconcile these competing aspects by subordinating one to the other.

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[18] We know from Aristotle that this was a favorite Platonic theme but we should not assume that the word ἀρχή has a strictly technical sense, since it may be given a simpler colloquial meaning within the present context. After reporting that Plato was accustomed to ask whether one was proceeding from the principles or to the principles, Aristotle (*EN* 1095a29–b4) introduces the distinction between what is more familiar to us and what is more familiar by nature. Of course, there are other technical and colloquial uses of ἀρχή that might also be brought into play here, e.g. the office of a civic or military leader may be an important analogy for the role of the Demiurge in the universe.

[19] See Fowler 1987 for the significance of λόγος as ratio in ancient mathematical thinking.

[20] Vlastos (1975, ch. 2) assumes that the section on Reason is exclusively concerned with the structure of the heavens, whereas the section on Necessity deals with the structure of matter. While this seems right as a general division, it does not explain why each section offers a different mathematical analysis of the four elements and their interrelationships.

For instance, sense-perception can be explained in purely material terms as a product of Necessity, but it becomes truly intelligible only when we explain it in terms of its rational purpose. It is important to note that Plato here anticipates the teleological perspective of Aristotle's *Physics*.[21]

III. *Competing Interpretations*

Within the framework of this general outline, let me now consider some contentious questions about the *Timaeus*, which may have led Plato's associates into disputes about its proper interpretation. These issues are linked with ambiguous passages which John Dillon (1989) thinks may have been subjected to what he calls 'ideological' interpretation, but I hold that they illustrate in a particularly clear fashion the typical hermeneutical situation of every reader of ancient texts. In the case of ancient classical texts, one might be tempted to think that historical distance is responsible for most of our interpretive difficulties, but this fails to explain why Aristotle and Xenocrates differed so radically on the interpretation of the *Timaeus*. With regard to this dispute, I think that Aristotle adopted a literal approach to the whole dialogue because he read it as a treatise like *De Caelo*. Therefore, just like many modern interpreters, he saw Timaeus as being merely a mouthpiece for Platonic arguments which can be isolated from their dramatic contexts and tested for their truth value. Unfortunately, the surviving fragments of Xenocrates[22] do not enable us to reconstruct the background for his metaphorical interpretation of Plato's *Timaeus*, but my conjecture implies that his own cosmological views would have influenced his reading in quite a different way. So this hermeneutical conjecture can be tested adequately only in the case of Aristotle.

One of the most divisive issues for the ancient interpreters of the *Timaeus* was the question of whether its description of the generation of the universe should be taken literally or metaphorically. Now it is easy to understand how

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[21] But, if this is the case, one might be legitimately puzzled as to why Aristotle does not acknowledge Plato as having already discovered the cause called 'that-for-the-sake-of-which' (τὸ οὗ ἕνεκα). My proposed solution is that Aristotle rejected Plato's mathematical account as a causal explanation for the sensible and physical world in any of the four senses of 'cause'. Furthermore, the final cause towards which the cosmic Craftsman looks is something transcending the universe rather than immanent in it.

[22] These fragments were collected by Heinze (1892) at the end of the nineteenth century, but their inconsequential character has led modern scholars to neglect Xenocrates almost completely.

later Christian interpreters of Plato might have a vested interest in taking this description literally, so as to reconcile it with literal interpretations of *Genesis*. On the other hand, Neoplatonists such as Iamblichus and Proclus had equally strong reasons for defending a metaphorical interpretation.[23] But these later 'ideological' divergences do not help us to understand why Plato's companions in the Old Academy became so deeply divided on a question which he himself could surely have cleared up if he had been asked. Among
[7] the many riddles presented by Plato's | Academy, I regard this as one of the most profound because it has interpretive implications for all his dialogues. In the face of this riddle, John Dillon confesses honest puzzlement: 'What is disturbingly plain, arising out of all this frantic (interpretative) activity, is that the Master himself managed to avoid giving any definitive account of what he meant to his immediate followers. How he managed to avoid this I do not know, but I see no other explanation of the phenomena' (1989: 72). In the light of this riddle, I want to suggest that the dispute between Aristotle and Xenocrates over the correct interpretation of the *Timaeus* hinges on their acceptance or rejection of Plato's mathematical cosmology. In the case of Aristotle, there is some textual evidence from *De Caelo* which shows that his opposition to this kind of cosmology dictates that he take Plato's account literally. Despite the lack of evidence, one must also assume that Xenocrates used the metaphorical interpretation to defend his own appropriation of Platonism.[24]

Having argued for the uniqueness of the universe in *De Caelo* 1.8–9, Aristotle subsequently (1.10–12) takes up the question of whether or not it is eternal. He begins this treatise by reviewing the opinions of all those predecessors who agree that it is generated, but differ about the possibility of its corruption. (a) Some say that it is everlasting, even though it was generated; (b) others claim that it is perishable like any of the other things that are constituted by nature. (c) Still others claim that at one time it is being generated, while at another time it is perishing, and that this continues

[23] Proclus, *in Resp*. 76.17–86.23 distinguishes two classes of myth, which correspond generally to his division between eiconic and symbolic mimesis. On the one hand, there is an educative myth, which is fashioned with the hearer's character in mind; whereas, on the other hand, the entheastic myth is designed to represent the whole of reality from its lowest manifestations to its highest unity.

[24] There is some fragmentary evidence that Xenocrates tried to give allegorical versions of his basic philosophical positions, e.g. his distinction between three types of substance is linked with the three Fates (Sextus, *adv. dogmat*. I, 147 ff.) or his division between gods, daemons, and humans is associated with the different types of triangle (Plutarch, *de def. orac*. 12, 416c).

always in such a way. Aristotle explicitly (279b14–16) attributes this latter view to both Empedocles and Heraclitus.[25] Of the other views listed, the first has traditionally been assigned to Orpheus and to Hesiod, but Guthrie (1962: 282) thinks that the Pythagoreans also subscribed to it. The second view was held by the Atomists, according to Simplicius, who cites Aristotle's lost treatise on Democritus.[26]

To understand Aristotle's criticism of these opinions, however, it is not necessary to positively identify those who held them. If we could do so, perhaps we would find that he was not doing them justice, as Cherniss has repeatedly claimed.[27] But Aristotle is not pursuing historical doxography according to our canons of evidence, since the survey of opinions is a methodological preamble to his own definitive statement on the question. From that perspective, it is understandable that the views of individual predecessors may be plucked out of context and pitted against other opinions to produce the impasse (ἀπορία) that is to be resolved through Aristotle's own principles. We find that this is indeed the typical way in which he treats his predecessors, many of whom he does not name, even while mangling their views on the Procrustean bed of his own method. For instance, in the above passage from *De Caelo*, his attribution of the third view to Heraclitus is historically very dubious.

Having sketched the previous opinions, Aristotle tries to show that each | [8]
position is untenable. The view that the world is generated but eternal, for instance, seems to be impossible because these are mutually exclusive characteristics. As a basis for his objection, Aristotle appeals (279b18–20) to the maxim that it is only reasonable to posit what we see holding generally or universally. Many ancient commentators understood Aristotle to be directing his criticism at the talk about generating a cosmos in Plato's *Timaeus* (33b ff.).[28] Even if Plato were looking for a metaphorical way of comparing the duration of the sensible cosmos with the eternality of the supersensible world upon which it depends for its causal principles, Aristotle denies him this possibility

[25] On Empedocles, see *Met.* I, 4, 985a23, DK 31A37; on Heraclitus, see Clement, *Strom.* v, 104, 1 & 3, DK 30 & 31.

[26] Cf. Simplicius, *In de caelo* 294.27; 295.1–22.

[27] Cf. Cherniss 1935 & 1944.

[28] Cf. Alexander *apud* Simplicius *In de caelo* 293.14–15 & 296.5–6. In opposition, Simplicius (296.16 ff.) cites the *Timaeus* as showing that the sensible world is intended to be generated, whereas the intelligible world is not. Further, with respect to the intelligible world, he treats all temporal talk as metaphorical, since Plato makes clear that time is generated along with the visible cosmos.

by seizing on the literal meaning of the words 'to have a beginning'. His subsequent argument can be taken in two parts which cover the logical possibilities, namely, either the world had a beginning or it did not. (a) If the present state of anything (e.g. the world or its elements) had no beginning and for all time prior to this it has been impossible for it to be otherwise than it is, then it is impossible for that thing to change. For, if it could change, this would be due to some cause which already was present in some way. But this would mean that what could not be otherwise (i.e. what is eternal) could have been otherwise, and this is a contradiction. Thus it is clearly impossible for something to change which has no beginning. Aristotle now takes up the other possibility. (b) Let us suppose that the world has been formed from elements which at one time were otherwise than they are now: (i) if they had always been in that state and could not change, then obviously the world could never have been generated; (ii) but since it has been generated, it is clear that these elements must be capable of change and are not fixed forever in any present state. Hence their present combination will be dissolved, just as previous combinations were, and this process can go on indefinitely. If this is the case then the world is not indestructible, for either it has been or it might be other than it is.

This concludes Aristotle's refutation of the first position, namely, that the world has everlasting duration, even though it had a beginning. But he adds a very interesting excursus against those who try to defend this position by drawing an analogy with the method of geometers. Cherniss[29] thinks this passage reflects a debate among the pupils of Plato, and that Aristotle is responding here to a polemical attack from Xenocrates. Undoubtedly, a lively debate was carried on about Plato's *Timaeus*, as is clear from this reference to a metaphorical interpretation offered by some Platonists.[30] Aristotle's attitude to their interpretation is perfectly reflected in his flat statement (279b34) that the claim upon which it is based is not true. As he sees it, his opponents already have conceded that there is an apparent contradiction in holding

[29] Cherniss (1944: 421–422) interprets the subsequent Platonic tradition as showing that γενόμενον as applied to the universe could be taken to mean that it is 'always becoming', as distinct from the Forms which 'always are'; see *Tim.* 27d–28a. Thus Xenocrates, Speusippus and Crantor took the cosmogony of the *Timaeus* to be θεωρίας ἕνεκα, so that the universe is without a temporal beginning but is γενητόν insofar as it is dependent on an external cause.

[30] David Lachterman (1989: 61ff.) plausibly connects this with another ancient debate, reported by Proclus (*In Eucl.* 77.16ff.), as to whether one should talk about 'problems' or 'theorems' in relation to geometry. The point is that 'problems' require something to be done, and this would seem to involve a temporal element in geometry, as in all making or doing.

that the world is indestructible and generated at the same time. Thus their defence involves claiming that the contradiction is only apparent because what they say about the generation of the world is analogous to the diagrams drawn by mathematicians. But what is implied by the analogy? Just as the | [9] geometer 'generates' diagrams for the sake of instruction (διδασκαλίας χάριν), so also the Platonists talk about the 'generation' of the cosmos for the purpose of understanding it better. Hence their metaphorical talk does not imply that the world was ever generated, any more than geometry involves the birth and growth of figures.

But, as one might expect, Aristotle refuses to accept the analogy on the grounds that the two situations are not parallel. In the case of geometrical construction, when all the elements have been put together, the resulting figure does not differ in kind from them. In the accounts given by the Platonists, however, the result does differ in kind from the original elements.[31] For instance, they say that ordered things (τεταγμένα) are generated from disordered things (ἐξ ἀτάκτων). However, it is impossible for the same thing to be both ordered and disordered, since these two states must be separated by a process involving time as an essential concomitant of change in the physical world. But, in the case of mathematical diagrams, there is no temporal process involved.[32] It is wholly incidental to the character of mathematics as a science that it actually takes the geometer some time to construct the figures which he uses for instructional purposes. Therefore Aristotle denies that there is any basis for the analogy between mathematical 'generation' and the physical generation of the cosmos.[33] Behind this denial lies his sharp distinction between physics and mathematics, which undermines the whole project of the *Timaeus*.

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[31] Aristotle seems to be arguing that Plato's analysis of the regular solids into surfaces involves a transition into another genus, which is ruled out by his own analysis of physical change in terms of a transition between opposites within the same genus; see *Physics* I. Tarán (1981) accuses Aristotle of begging the question here, but perhaps he fails to see that the whole argument depends on the distinction between mathematics and physics.

[32] It is interesting to note that Aristotle here seems to espouse Platonic views about the eternal and immutable nature of mathematical objects. But his point is more likely to be that the sense of 'generation' in mathematical construction does not involve a temporal process, since this is one way of distinguishing mathematical from physical objects; see *Metaphysics* VI, I & III, 5, 1002a28–b10.

[33] Simplicius *In de caelo* 305.12–14 expresses his surprise at Aristotle's failure to see that Plato's purpose was to analyze the sensible cosmos by analogy with hypothetical reasoning in geometry. But I doubt whether Aristotle missed this point, given that he made extensive use of such hypothetical reasoning in his own analyses of physical processes.

IV. *Reckoning Up Accounts*

According to Harold Chemiss, Aristotle entirely failed to understand the mythical character of the *Timaeus* because he was so intent on refuting Plato in his own literal-minded way. Although Xenocrates understood that the dialogue should be taken metaphorically, he also failed to interpret Plato correctly when he describes the soul as a self-moved number. Cherniss (1945: 44) concedes that Plato defined the soul as self-moved in the *Phaedrus* (245–246) and the *Laws* (895b–896a), but insists that there is no reference to self-motion in the creation myth of the *Timaeus*, where the constitutive factors of the soul are described. Cherniss even claims to know Plato's motivation for this 'glaring omission' (since this concept of soul is held to be implied at 46d–e), namely he wanted to put his exposition forward as a 'creation myth' and so he had to suppress discussion of self-motion as that essential characteristic which guaranteed that the soul, and so also the physical universe, is without beginning and end. Unfortunately Cherniss does not tell us why Plato wished to describe the nature of the universe in mythical form, if there was a more straightforward description available. In fact, I think that an answer to this question might help us to understand
[10] better why two entirely different traditions of | interpretation emerged out of the Academy itself.

For instance, what are we to make of the peculiar fact that two associates of Plato offered two diametrically opposed interpretations of crucial passages in the *Timaeus*, even though they must have had ample opportunity to ask the Master what he had meant? The sort of answer we give will depend on our conception of the Academy and of Plato's role in it. It will also depend on whether we view the dialogues as vehicles of dogma or as open-ended discussions of leading questions that were proposed to a community of inquirers, much like the problem of the planets was set before the astronomers. From what I have said so far it should be obvious that I see Plato as a non-dogmatic thinker who deliberately used the dialogue form to pose questions for a community of inquirers that included many independent scientists like Eudoxus and philosophers like Aristotle, Speusippus and Xenocrates. Even in the case of an apparently dogmatic dialogue like the *Timaeus*, the studied ambiguity of Plato's likely story about the 'generation' of the cosmos seems designed to stimulate further cosmological inquiry. Therefore, I am not surprised that Aristotle and Xenocrates took quite different directions in such an inquiry, depending on whether or not they accepted the project of mathematical cosmology as legitimate. Judging by the limited evidence available, Xenocrates did continue this project and

developed a position which was different from that of Speusippus, who also continued with the mathematicising project. By contrast, Aristotle rejected this project and developed his own science of physics as the way of inquiry for the sensible universe. So his radical dissent also prejudiced his whole interpretation of the *Timaeus* dialogue.

Conclusion

In summary, my historical look at different interpretations of the *Timaeus* tends to confirm Gadamer's thesis about the inescapability of the so-called 'hermeneutical circle'. Even in the case of Plato's intimate associates, there was no escaping the task of interpreting the written text against a background of assumptions about the form and content of the dialogue. If my argument is correct, Aristotle insisted upon a literal interpretation because he read the dialogue as a cosmological treatise in disguise, while giving his own undisguised reply in the *De Caelo*. By contrast, Xenocrates offered a metaphorical interpretation of the likely story narrated by Timaeus because he read the whole dialogue in the light of an established convention that mythical narratives should not be taken literally. In adopting this interpretative stance, he may have been motivated by his acceptance of the mathematical approach to cosmology; just as Aristotle was motivated by his rejection of this whole project. Despite their strong motivations for offering quite different interpretations, however, there is no indication that either of Plato's associates contemplated the emendation | of his text to [11] remove its ambiguities. To paraphrase Marx, the point is not to change texts, but to interpret them.

THE *PAIDEIA* OF THE HISTORICAL PROTAGORAS

When trying to recover the genuinely historical doctrines of Protagoras, we are faced with the paradoxical situation of having both too little and too much material available. On the one hand, we have too little authentic material since there are only a few Protagorean fragments extant, in the form of quotations and lists of titles of what were presumably prose treatises. On the other hand, we have too many second-hand reports from later Greek thinkers, such as Plato and Aristotle, whose own anti-sophistic agendas cast some doubt on the reliability of their accounts. In addition to Plato's *Protagoras* and *Theaetetus*, we can also find a comic parody on Protagorean teaching in the *Clouds* of Aristophanes, where he stages an eristic contest between the Just and Unjust *Logoi*, presumably by way of imitation of sophistic competitions. The problem for modern scholars is how to give a plausible interpretation of all this secondary material that makes sense of the sparse primary material. In addressing such a hermeneutical problem, I suggest that we can enlist the help of an anonymous sophistic treatise, called *Dissoi Logoi*, which may be taken to reflect the theory and practice of Protagorean *paideia*.[1]

Within the confines of this short article, however, I want to argue that Protagoras offered a new type of *paideia*, as distinct from the traditional poetic *paideia*, which was designed to impart to young men the debating skills that were necessary for political success in democratic Athens. An important part of this *paideia* consisted of teaching these students how to argue on both sides of every question or *topos*. Such an argumentative technique is suggested by the reported title (*Antilogiai*) of a treatise of Protagoras and by the putative contents of another treatise called *Trial over a Fee*. I hope to elaborate on these tantalising hints by drawing extensively on an extant treatise called *Dissoi Logoi*,[2] which we have some reason to believe was directly influenced by the pedagogical practice of Protagoras.[3] This treatise seems to be an original document dating from the

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[1] This point has already been made by de Romilly (1992: 76–77), who sees *Dissoi Logoi* as a blueprint for teaching methods in the Protagorean mode.

[2] Ed., trans. Robinson 1979a; DK 90, II.405–416.

[3] Versényi (1962: 181n7) has provided a good summary of the reasons for the general scholarly consensus that *Dissoi Logoi* was influenced by Protagoras.

end of the fifth century, which can provide us with a unique insight into both the content and format of sophistic treatises.

Scholars have long recognised that one ostensible purpose of such treatises was to advertise the intellectual wares of some sophist who was trying to attract rich young men as students. But the suggestion I want to develop is that another function of these treatises was to serve as textbooks for the teaching activity of the sophists themselves, who encouraged their students to memorise the competing arguments. This does not appear so strange if we recall that traditional modes of education for young aristocrats included memorising and reciting Homeric poetry, as well as performing in the chorus of a Greek tragedy. What was different about the *paideia* of the sophists was that students were asked to memorise not oral poetry but rather written 'commonplaces' that could be used to generate opposing arguments on any topic. Just as in the case of poetry, of course, mnemonic techniques were relied upon for the task of memorisation but what was truly revolutionary about this new sophistic education was the analysis and evaluation of dialectical reasoning in prose format which lay at its core. This marks the transition from the poetic culture, which depends on repetition and mimicry, to the prose culture of analysis and argumentation which resulted from the literate revolution that swept through ancient Greece in the sixth and fifth centuries.[4]

I. *Protagoras as a Teacher of Civic Virtue*

Let us start from Plato's representation of Protagoras as proudly claiming to be a teacher of civic virtue, while keeping in mind what this claim meant within the context of fifth-century Athenian democracy. We should also, perhaps, recall the well-attested historical fact that Protagoras was chosen as the official lawgiver to a pan-Hellenic colony at Thurii which Athens founded in 443 BC. This signal honour bestowed on a foreigner testifies to the high reputation which Protagoras enjoyed at Athens, both as a lawgiver and educator—roles which were closely linked in the popular mind that was shaped by the poetry of Solon and Tyrtaeus. Despite reports about Protagoras being subsequently charged with impiety, we have every reason to believe that he continued to enjoy a successful career as an educator not only at Athens but also in other Greek cities. Thus the open questions which I want to consider are the following: What did he teach? How did he teach it?

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[4] See Havelock 1986, ch. 10: 'The Special Theory of Greek Literacy'.

In Plato's *Protagoras*, the key civic virtues are listed as justice, temperance, and holiness or piety (*dikaiosunê*, *sôphrosunê*, *to hosion einai*, 325a1). It is said that everyone in society, but especially within the family and at school, tries to inculcate these virtues in the young man (324e2–326c3). The analogy with learning a language is drawn by means of the question: Who teaches the boy to speak Greek? (327e3–328a1). The obvious answer is: everyone in general but nobody in particular, as it is through acculturation that the boy learns his native language. But the crucial question is whether the same is true for learning the civic virtues. If it is, then it is unclear what educational function is to be performed by the teaching of sophists like Protagoras.

It would seem, on the one hand, that he cannot possibly justify charging fees for teaching what everyone already teaches the young, namely, civic virtue. Yet, on the other hand, it seems that he had no difficulty in collecting such fees, as we can gather from hostile comments by Aristophanes and Plato.[5] Within every culture education is a sensitive matter, because it involves the transfer of privileged values from one generation to the next and thus plays a central role in social and cultural hegemony. Within culturally hermetic societies this transfer is made in a rigidly prescribed format from elders to youths, e.g. through ritual initiation into a warrior band, as in Sparta.[6] But within ancient Athens, which was changing rapidly both culturally and politically, educational experts like the sophists found a lucrative role as purveyors of cultural values. So what were these values and how were they imparted to the gilded youth of Athens?

In seeking an answer to such questions, the obvious place to start is with Plato's *Protagoras*, as it contains a long discussion of the content and methods of Protagorean *paideia*. But things are never quite so simple with Plato, and we must keep in mind a number of caveats. First and foremost, the predominant mode of discourse is that of a dialogue between Protagoras and Socrates, and it remains unclear whether or not this was typical for Protagoras' own method of teaching. Second, the myth narrated by Protagoras could very well be typical of the 'long speeches' that are attributed to him, but we cannot be sure that the narration of myths was part of his regular teaching. In addition to the myth, Protagoras is also represented as trying to persuade Socrates by means of an argument (*logos*). A significant part of this argument consists of an extended description of traditional Athenian modes of education,

[5] See *Clouds*, 98–99, 876; *Hipp. Maj.* 282b1–e8.

[6] Jaeger 1945: 21; Marrou 1956: 31–32; Griffith 2001: 36–43, 48–56.

at home, in school, and within the city. In this way, Protagoras claims to have demonstrated that virtue can be taught, but he is never represented as actually engaged in the process of teaching virtue, although he professes to be a teacher of it. Perhaps one might think of this as simply a shortcoming in Plato's dialogue format, but I attach significance to this lacuna as being indicative of his conviction that Protagoras is incapable of teaching virtue. What this means, however, is that we must go beyond Plato in our search for an historically accurate account of the *paideia* of Protagoras.

Near the beginning of the eponymous dialogue, Protagoras is identified as a wise man (*sophos*, *sophôtatos*, 309c13–d2) with something valuable and desirable to teach young men like Hippocrates (*to sophôtaton*, 309c11, *monos … sophos* 310d5–6). Apparently, we have here an elderly Protagoras who has not visited Athens for some time but who is still much sought after, especially for his cleverness at speaking (*sophôtaton … legein*, 310e6–7). Socrates quizzes Hippocrates as to what skill he expects to learn from this travelling teacher (311a8–312b6). By analogy with other crafts like that of a doctor or sculptor, Protagoras is reputed to be a sophist (*sophistês*), and paid a fee as such (311e1–6). But the logic of the craft analogy implies that Hippocrates wants to learn how to be a sophist, though such a suggestion makes him blush for shame (312a2–4). This throws up an initial puzzle: How is the content so desirable, yet the craft itself so disreputable? A solution is found through a new parallel with the language-master (*grammatistês*), lyre-master (*kitharistês*) and sports-instructor (*paidotribês*) (312a7–b1). Young men do not take lessons from these people in order to become professional craftsmen (*epi technês dêmiourgoi*) but rather for the sake of education (*epi paideiai*), as properly befits a gentleman (*hôs ton idiôtên kai ton eleutheron prepei*, 312b2–4). This solution saves the blushes of Hippocrates who wants to become an Athenian gentleman who participates in public affairs, and not a banausic craftsman like the travelling sophists (312b4–6).

Now there arises a subsequent question as to what exactly a sophist is (312c1–e6). As the name implies, he is someone who has knowledge of wise matters (*tôn sophôn epistêmôn*). Once again, by analogy with the other crafts, Socrates can ask: What sort of work (*poias ergasias*) does the sophist perform? The reply of Hippocrates is that he is master of making one a clever speaker (*deinos legein*). But, again following the analogy with other crafts, the next logical question is about the subject-matter (*peri tinos*) involved. This boils down to the question: Of what thing does the sophist have knowledge which he conveys to his pupil? Yet such a line of questioning reduces Hippocrates to a state of puzzlement, thereby suggesting that the sophist's claim to expertise is problematic.

Subsequently (313c4–314b4) Socrates gives a preliminary definition of the sophist as a sort of merchant (*emporos*) or dealer (*kapêlos*) in goods by means of which the soul is nourished (*trephetai*). What are these goods? Socrates assumes that they are doctrines or teachings (*mathêmata*), and he warns Hippocrates against these indiscriminate purveyors of goods for the soul, on the grounds that they do not know whether or not these are really good for the soul, but simply hawk them around the cities, recommending everything for sale. Once again, these goods are described as 'doctrines', while transactions with sophists like Protagoras are described in terms of purchasing doctrines (*ôneisthai mathêmata*). Socrates claims that this is more dangerous than buying food for the body because these sophistic doctrines are directly ingested by the soul without the possibility of testing them.

In the interests of brevity, I want to highlight merely a few significant points about Socrates' preliminary approach to Protagoras on behalf of Hippocrates (316a6–e5). Firstly, Protagoras offers them a choice between a private conference or a public discussion. Secondly, Socrates recounts the pedigree of Hippocrates (i.e. noble family and fine nature [*phusis*]) and reports that his ultimate goal is to gain a reputation in the city (*ellogimos … en têi polei*), which he hopes to achieve by consorting (*sungignesthai*) with Protagoras. Thirdly, Protagoras complains about the obstacles which a sophist faces as a stranger in any Greek city, when trying to persuade the best young men (*hoi beltistoi*) to drop their other intimate connections (*sunousiai*) and to join his own circle. This requires caution (*eulabeisthai*) because of the great jealousies that arise, along with enmities and intrigues. Fourthly, Protagoras claims that the art of sophistry (*hê sophistikê technê*) is quite ancient but that the people who practised it, like Homer, Hesiod, and Simonides, disguised it under socially acceptable masks, e.g. poetry, soothsaying, athletics and music.

By contrast with these disguised sophists, Protagoras makes an open avowal of his art of sophistry (316e5–317c3). As a negative justification, he claims that the disguise used by the ancient sophists did not fool the most powerful people in the city, though it may have worked for the mob. As a positive justification, he declares honesty and openness to be the best policy. Thus Protagoras admits (*homologô*) to being a sophist who educates people (*paideuein anthrôpous*). He regards this precaution (*eulabeian*) as being the better of the two, i.e. that of admitting rather than denying. By way of conclusion, Protagoras outlines his own track record: for many long years now he has been in the profession (*en têi technêi*), since he has lived to a ripe old age and could very well be a father to any member of his audience, except perhaps Socrates.

At this point (317c4–318a9), a decision is made about the preferred option when Protagoras declares that it pleases him best (*hêdiston esti*) to make a discourse (*ton logon poieisthai*) in the presence of all. In a narrator's aside, Plato has Socrates confess his suspicion that Protagoras wished to put on an embellished demonstration (*endeixasthai kai kallôpisasthai*), by way of competition with Prodicus and Hippias, having just snared a rich young aristocrat as student. Callias, however, describes it as a dialogue (*dialegesthai*) where an audience presumably listens to the (competitive) discourse of wise men (*sophoi*). Protagoras rather formally invites Socrates to repeat the question about the benefit to be obtained from associating with Protagoras. He replies that on the very first day that Hippocrates joins his company, he will go home a better man (*beltiôn*) and similarly on all subsequent days he will continue to improve (*epi to beltion epididonai*).

Socrates presses Protagoras to specify the manner of the object with respect to which the young man will become better, by analogy with other crafts which are taught (318b1–d4). For what (*eis ti*) and in what connection (*peri tou*) will the young man become better on the first day of coming together with Protagoras? Protagoras responds (318d5–319a2) with a preliminary distinction between his own teaching and that of ordinary sophists, who force the young to learn arts (*technai*) like arithmetic, astronomy, geometry and music. At this point Plato's 'stage directions' indicate a significant glance at Hippias, who was famous as a polymath. Protagoras charges that young people have fled (*pepheugotas*) from the arts, and promises that he will satisfy their real desire for learning (*to mathêma*) good judgment in their own affairs (*euboulia peri tôn oikeiôn*), i.e. how best to order their own households. And, with respect to the affairs of the city (*peri tôn tês poleôs*), the learning consists in showing how to gain most influence on public affairs, both in speech and action (*ta tês poleôs … dunatôtatos … kai prattein kai legein*).

Concerning Protagoras' claim, Socrates requests clarification as follows: are you speaking of the civic science or political art (*politikê technê*) and claiming to make men into good citizens (*poiein andras agathous politas*)? Protagoras agrees that this is the profession (*to epangelma*) which he professes. This leads directly to the topos of whether virtue can be taught (319a3–320c1), and here we can find many parallels with the arguments in *Dissoi Logoi*. Socrates begins by saying that what Protagoras professes would be a fine accomplishment (*technêma*) if indeed he had accomplished it. But he doubts whether civic virtue is teachable (*didakton*), given the common practice of the Athenians who are assumed to be wise. When the Assembly (*ekklêsia*) gathers to discuss building affairs, it requests the advice of builders on such proposals. And the same applies to all the arts which are considered

learnable and teachable (*mathêta te kai didakta*). In such discussions, if anyone whom the people do not regard as a craftsman tries to advise them, he is shouted down, no matter how noble (*kalos*) and wealthy (*plousios*) and well-born (*tôn gennaiôn*) he may be. This is the procedure of the Assembly in matters to do with the crafts. But when it deliberates on matters of state (*peri tês poleôs*), the one who rises to advise the people (*sumbouleuei*) may be a smith, a shoemaker, a merchant, a sea captain, a rich man or a poor man, a man of good family or low-born (*agennês*). Yet nobody objects, as one would in the former case, that his attempt to give advice is not justified by instruction (*mathôn*) received anywhere nor by guidance received from any teacher (*didaskalos*). Obviously, the reason is that the people do not hold that this is something which can be taught (*didakton*).

Socrates adds another argument (319d7–320b3): This holds true not only in public affairs (*to koinon tês poleôs*) but also in private life (*idia hêmin*) where our best and wisest citizens are unable to transmit this excellence (*aretê*) of theirs to others. He offers as an example Pericles, the father of the two sons present in the dialogue, who gave them a first-rate training in subjects where he found teachers (*didaskaloi*) but in those matters in which he is himself wise neither trains them personally (*autos paideuei*) nor commits them to the guidance of another. Instead, he allows them to wander about like the sacred oxen that graze at will, on the off chance that they might pick up *excellence* (*aretê*) for themselves. There are many examples of virtuous people who failed to make anyone else better either in their own family or in that of others.

We might give the following summary of Socrates' objection (320b4–c1): he believes that virtue is not teachable due to these generally accepted experiences. But he then challenges Protagoras to demonstrate (*epideixon*), on the basis of his own experience of many things, either learned (*memathêkenai*) or discovered for himself, that virtue is teachable. This challenge prompts Protagoras to offer the myth of Prometheus by way of a demonstration (long speech rather than short speech) (320c2–323a3). One key point of the myth is that primitive cities, which were founded for the sake of security, tended to break down because of the injustice of citizens towards each other, since they lacked the civic art. Thus, given the danger of destruction for mankind, Zeus sent Hermes to bring the dual gifts of respect (*aidôs*) and justice (*dikê*), in order that there should be regulation of cities (*kosmoi poleôs*) and friendly ties (*desmoi philias*) that bind human beings together into political community. But, unlike the other specialised arts such as medicine, the civic art is to be distributed universally to all men, and Zeus' law is that anyone who cannot partake of respect and justice shall be put to

death because he is a public pest. This is also offered by way of explanation for the noteworthy difference between public consultation on specialised matters, where only a few craftsmen are consulted, and on public matters where everyone in the city is consulted because what is needed is justice (*dikaiosunê*) and good sense (*sôphrosunê*), and everyone is assumed to have these virtues as a precondition for the very existence of the city as a political community.

Subsequently, Protagoras departs from his mythical narrative to explain why it is not a mistaken assumption that everyone partakes of justice and the rest of civic virtue (323a5–c2). He offers an additional sign (*tekmêrion*) as follows: when a man professes to be good at a specialised skill that he does not have, then people scorn him as mad. In the case of civic virtue, by contrast, he is considered mad to admit that he does not have it, even if people know him to be unjust. The common opinion is that everyone should profess to be just in order to be considered human, so that anyone who does not is considered mad (*mainesthai*). Furthermore, people do not regard civic virtue as natural (*phusei*) or spontaneous (*apo tou automatou*), but rather as something taught (*didakton*) and acquired through careful preparation (*ex epimeleias*). Protagoras explicitly undertakes to persuade Socrates about this claim (323c3–324a3). He offers the following evidence: in all cases where men suffer evils by nature (*phusei*) or by fortune (*tuchêi*), nobody is angry with them or reproves (*nouthetei*) or lectures (*didaskei*) or punishes (*kolazei*) them with a view to changing them, but merely pities them (*eleousin*). The reason is that it would be foolish to try to improve the ugly, the puny or the weak, since everyone recognises that it is by nature and fortune that people get these good things (*ta kala*) or their opposites. However, in the case of those human goods that people are supposed to get by application (*epimeleia*) and practice (*askêsis*) and teaching (*didachê*), then people are blamed and punished, or reproved, when they are found lacking. This is especially true for injustice (*adikia*) and impiety (*asebeia*), i.e. whatever is opposed to civic virtue (*politikê aretê*).

After sketching an account of punishment as educative (324a3–c5), Protagoras concludes that he has proved (*apodedeiktai*) that Athenians have good reason for admitting the advice of a smith or cobbler in public affairs and also that they regard virtue as something to be taught and procured (*paraskeuaston*) (324c5–d1). Protagoras explicitly switches over from myth (*muthos*) to argument (*logos*) when taking up the remaining puzzle (*aporia*) as to the conflicting behaviour of good men when educating their sons (324d2–325b4), i.e. they have their sons taught the subjects in the regular teachers' courses and thereby make them wise but on the other hand they

do not make them better (*beltious*) in that virtue wherein they themselves are good (*agathoi*). Thus he begins in typical dialectical fashion with a two-pronged question: whether or not there is some one thing (*poteron estin ti hen, ê ouk estin*) whereof all the citizens must partake, if there is going to be a *city* (*polis*). He declares that the answer to this question will resolve (*luetai*) the aporia, and then he proceeds to list several conditional sentences which have a direct bearing on his solution. In summary, if virtue is some one thing necessary for a political community, then good men behave absurdly in not teaching it to their sons. Protagoras now appeals to a previous conclusion to support his reductio argument (325b4–5): for we have proved (*apedeixamen*) that they regard this thing as teachable both in private (*idiai*) and in public life (*dêmosiai*).

It is possible that this elaborate conditional argument reflects something of the dialectical practice of the historical Protagoras. The implication of the reductio argument is explicitly drawn: this situation is so incredible that there must be an obvious solution which Protagoras now supplies. In fact, good people teach (*didaskousi*) and admonish (*nouthetousin*) their children from earliest childhood until the last day of their lives (325c5–6). There follows a description of traditional moral education (325c6–326e5), but nowhere in the *Protagoras* dialogue do we find a similar description of Protagorean *paideia*. The closest we come to that is an explicit defence of his own role as a teacher of civic virtue.

This is to be found within a context where Protagoras returns to Socrates' objection that there is no teacher of virtue, as against his own claim that everyone is a teacher (327e1–328b1). The following analogy with language is drawn: suppose you asked, who is a teacher of Greek (*tis didaskalos tou hellênizein*)—you would not find any. Similarly, suppose you asked about who can teach the sons of artisans the crafts they learned from their fathers, and if you asked who was to give them further instruction, it might be difficult to find them a teacher but easy in the case of those starting with no skill (*apeiroi*). The case is similar with virtue and everything else: when there is somebody who excels over us a little in showing the way to virtue (*probibasai eis aretên*), we must be grateful (*agapêton*).

Protagoras now makes his (modest?) claim to being a teacher (328b1–c2): I take myself to be such a person, who excels (*diapherontôs*) all other men in assisting people to become good and true (*pros to kalon kai agathon genesthai*), and giving full value for the fee (*axiôs tou misthou*) that I charge. In fact, Protagoras boasts about the fairness of his arrangements for payment of that fee: when anyone has had lessons from Protagoras, he pays the fee requested, if he is willing (*boulêtai*). If not willing, then he goes to a temple

and swears on oath the value he sets on what he has learnt, and deposits that amount. Given the title of one of his treatises (*Trial over a Fee*, see below), perhaps Plato's Protagoras is gliding over the possibility of legal disputes with his students over the payment of fees.

Protagoras now summarises the whole argument that was given to persuade Socrates (328c3–d2): I have shown by myth and argument (a) that virtue is teachable (*hôs didakton aretê*), and (b) that it is so deemed by Athenians, and (c) that it is no wonder (*ouden thaumaston*) that bad sons are born of good fathers, and good from bad, since the same is true for the sons of craftsmen like Polycleitus. But Protagoras adds a clever caveat in the case of Paralus and Xanthippus, who are potential students in the audience: it is not fair to make this complaint of them yet, since there is still hope for them as young men (and rich enough to pay a fee for lessons). There is a striking parallel with *Dissoi Logoi* 6.8 where the same example of Polycleitus teaching his sons the art of sculpture is used as evidence that virtue can be taught. Indeed, such features of the *Protagoras* dialogue suggest that Plato might even have drawn on this anonymous treatise for some of his knowledge of the historical Protagoras.

II. Dissoi Logoi *as Sample Treatise for Protagorean* Paideia

Although only circumstantial evidence is available to support the hypothesis that *Dissoi Logoi* is a sophistic treatise in the Protagorean style, dating from about 400 BC, yet I think this is a plausible assumption for a number of reasons. For instance, we have a report from Diogenes Laertius[7] which seems to draw on Protagoras' so-called 'Art of Eristics' for the following quotation: 'Concerning every matter there are two arguments which are opposed to each other.' In his *Rhetoric*, Aristotle apparently is citing from the same Protagorean source when he talks about the goal of the eristic art as 'making the weaker argument stronger'.[8] On the basis of this first-hand evidence, it is plausible to assume that the 'anti-logical' structure of argumentation found in *Dissoi Logoi* faithfully reflects the structure of Protagoras' own works, namely, the *Antilogiai* and *Technê Eristikôn*.[9] As additional circumstantial evidence, we might refer to Aristotle's report in the *Sophistical Refutations* about the

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[7] (*kai prôtos ephê*) *duo logous einai peri pantos pragmatos antikeimenous allêlois*. DL 9.51 = DK 80 B 6a, II.266.13–14.

[8] *to ton hêttô … logon kreittô poiein*, Arist. *Rhet*. 1402a23–24; DK 80 B 6b, II.266.15–16.

[9] DK 80 B 5, II.265.10–266.4; DK 80 B 6, II.266.6–16.

existence of manuals of eristic argumentation compiled by paid teachers of contentious argument (*hoi eristikoi logoi*), which followed the paradigm of Gorgias' mode of teaching. Just as he gave his pupils model speeches to learn by heart, so also teachers of eristics provided a standard schema of questions and answers for memorisation by their students, including arguments on both sides of each question.[10] Aristotle's criticism of this method of teaching was that it did not impart the art of argumentation but merely the products of the art (*ta apo tês technês*).[11] Without evaluating the legitimacy of this criticism, we can recognise from Aristotle's report a reasonably accurate description of the character of *Dissoi Logoi*, especially the first four chapters[12] where pro and contra arguments are set out in a format that lends itself to memorisation.

Therefore, despite the unfortunate paucity of evidence about the contents of Protagoras' own treatises, we are fortunate to have to hand a reasonably complete treatise in the sophistic mode, which has not been transformed into the dialogical format of Plato or into the art of dialectic, as that was outlined by Aristotle in the *Topics*. Even though scholars like Jaeger[13] and Marrou[14] have referred in passing to *Dissoi Logoi*, and even drawn on it for purposes of illustration, yet this anonymous treatise has not received the attention it deserves as an original document that faithfully reflects both the form and content of a typically sophistic treatise. In drawing on it for my purposes here, I will rely on Tom Robinson's fine critical edition of the text.[15]

Dissoi Logoi 1.1 begins with the dominant topos of the whole treatise: 'Double arguments are put forward by educated people in Greece' (*dissoi logoi legontai en tâi Helladi hupo tôn philosophountôn*). Although the terminology is quite different from the Protagorean fragment already quoted,[16] yet the basic idea is the same, namely, that two competing and opposite arguments can be given on any issue. With regard to the use of the term '*philosophountes*' here, I tend to agree with Robinson that it is sufficiently broad and non-technical to cover generally educated people as well as professional sophists.[17] This broad

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[10] *Soph. El.* 183b36–184a2.

[11] *Soph. El.* 184a2–8.

[12] Robinson 1979a: 98–125; DK II.405–412.20.

[13] Jaeger (1945: 315) refers to *Dissoi Logoi* for insight into the technique of speaking 'from both sides', which he takes to be central to Protagoras' *Antilogies*.

[14] Marrou (1956: 51) thinks that *Dissoi Logoi* was compiled by a disciple of Protagoras, though he dismisses it as a dull catalogue of mutually conflicting opinions.

[15] Robinson 1979a.

[16] DK 80 B 6a; see n. 9 above.

[17] Robinson 1979: 147.

sense of '*philosophia*' was still available to Isocrates much later when he used it to describe his own activity of teaching the rhetorical art as a vehicle for promoting general Hellenic culture rather than any specialised art.[18]

When we examine more closely the contents of the so-called 'double arguments' contained in *Dissoi Logoi*, we can find an implicit dialogical structure suggested by some question-answer formats, e.g. 1.14 says 'answer me this' (*tode apokrinai*). Perhaps these school exercises were conducted in a dialogical format so as to prepare the students for agonistic speech in the lawcourts, where being able to argue on either side of the case was a most useful skill. There is an extant report about the contents of Protagoras' treatise, called *Trial over a Fee*, which suggests that it was precisely this ability to argue on both sides that was being taught by means of this treatise itself.[19]

There is also a Protagorean theme to be found at *Dissoi Logoi* 2.20 where the following generalisation is stated: 'All things are seemly when done at the right moment but shameful when done at the wrong moment' (*panta kairôi men kala enti, en akairiai d' aischra*). Plato attributes a similar thesis to Protagoras, namely, that just actions are distinguished from unjust actions by being performed at the essential and right moment (*en tôi deonti kai tôi kairôi*: [Plato] *Just*. 375 A 2). In addition, Diogenes Laertius in his *Life of Protagoras*, claims that he was the first to propound the thesis about the power of the right moment (*prôtos … kairou dunamin exetheto*).[20] While this evidence is admittedly secondary and circumstantial, it does suggest that there is considerable continuity both in content and format between *Dissoi Logoi* and at least some of the lost treatises of Protagoras.

As I have noted, however, a significant puzzle about Plato's account of Protagoras in the eponymous dialogue is that, while he is shown to defend the thesis that virtue can be taught, there is little indication as to how exactly he proposed to teach it. Thus perhaps the only reliable source of information available about his teaching method is this anonymous sophistic treatise, *Dissoi Logoi*. If one can take this as a guide to the practice of sophistic *paideia*, it would appear that Protagoras taught his students how to argue on both sides of any question by rehearsing the arguments pro and contra on a few standard topoi. For instance, the first one[21] deals with good and evil by outlining arguments for their identity, and then ranging these against

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[18] Isocr. *Panath*. 28–32, *Antid*. 270.
[19] *Dikê huper misthou*, DL 9.55, DK 80 A 1, II. 255.4.
[20] DL 9.52.
[21] *Peri agathô kai kakô*: DK 90.1, II.405–407.16; Robinson 1979a: 98–105.

opposite arguments for differentiating good and evil. The initial impression that we get of the treatise is that of a dry intellectualist approach to the moral question about good and evil, as if rehearsing arguments pro and contra was the route to knowledge of good and evil.

But perhaps that impression involves a complete misunderstanding of the function of the treatise, which on further scrutiny begins to look more like a 'commonplace book' that gathers together a set of standard arguments pro and contra on any given thesis.[22] Certainly, we would classify the topics as moral issues but the approach being adopted is that of dialectical argumentation. For instance, the second of the *Dissoi Logoi* is about the noble and the disgraceful (*Peri kalou kai aischrou*),[23] which are evaluative and even emotive terms, yet what follows is a collection of arguments in favour of a sharp distinction between these terms, and an opposing set of arguments for their identity. So perhaps it is the wrong question for us to ask how such opposing arguments could be used to educate students about the noble and the disgraceful, since these evaluative attitudes may have been already inculcated in them through the primary education described in Plato's *Protagoras*. The main educational purpose of *Dissoi Logoi* seems to be that of teaching students how to argue on the basis of opposing arguments about the topos of the noble and the disgraceful.

The same thing seems to be true of the third of the *Dissoi Logoi*, which deals with the just and the unjust, as another *topos* that is central to all discussions of public affairs. Once again, we find no analysis of the nature of justice, as opposed to injustice; nor indeed any indication of how the virtue of justice might be inculcated in students through instruction. But all such expectations as we bring to our reading of the treatise are obviously influenced by our reading of Plato's *Republic*, which was itself a reaction against the sophistic method of teaching. So perhaps we should abandon such expectations as hermeneutically naive, and concentrate on discovering the real educational function of the treatise.

For that purpose the sixth of the *Dissoi Logoi* is perhaps the most informative, dealing with the question of whether wisdom and moral excellence are teachable, since we know from Plato's *Meno* that this was a typical sophistic *topos*. It is also in terms of their answer to this question that

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[22] Cicero, *Brutus* 46–47, reports Aristotle as saying that Protagoras prepared written discussions which are now called 'commonplaces' (*rerum illustrium disputationes, quae nunc communes appellantur loci*), as did Gorgias and Antiphon of Rhamnus.

[23] DK 90.2, II. 407.17–410.4; Robinson 1979: 104–115.

Socrates and Plato try to distinguish their views from those of the sophists. So it serves as a relatively well-lit clearing in the woods where the battle can be joined.

Once again, the chapter has the same general structure of opposing arguments which are marshalled on each side of the issue. The first argument against the teachability of virtue is quite superficial, as it assumes that virtue is something concrete, which cannot be simultaneously conveyed to another and also retained by the conveyor. But this notion of virtue is so mercantile that even hucksters of wisdom like the sophists would reject it. But the second argument strikes closer to home because it assumes (counterfactually) that there ought to be teachers of virtue, if it is teachable, just as in the case of the other arts. Protagoras would need to rebut this argument since he explicitly claimed to be a teacher of virtue, by analogy with teachers of the other arts.

A third argument, which is also rehearsed in Plato's *Protagoras*, is that people like Pericles who are renowned for wisdom would surely have taught their own children, if virtue and wisdom were teachable (6.4). Behind this argument we can discern the folk knowledge that many a wise and virtuous father reared a foolish wastrel as a son, and ordinary people might well assume that he would not have been so careless about his children's education, if indeed virtue were teachable. But perhaps a more pressing objection against the professional claims of a sophist like Protagoras is that people who have associated with known sophists have not become virtuous or wise as a result (6.5). And, conversely, many people who never associated with sophists, have managed to become reputable citizens (*axioi logô*) without their help (6.6).

These last two related arguments constitute perhaps the greatest challenge to the claim of Protagoras to be a teacher of virtue, given that he also promises tangible results, such as success in household management and in the affairs of the city. Therefore, it would be crucial for any sophistic treatise in the Protagorean mould to rebut these objections to his professional claims, while also giving positive arguments in support of his claim to teach wisdom and virtue. So it would be no surprise if such a treatise adopted the format of opposing arguments, because that would teach students how to deal with standard objections to the claim that virtue can be taught.

At this point in *Dissoi Logoi* (6.7) begins a defence of the counter-thesis which is explicitly backed by the author: 'I myself consider this line of reasoning exceedingly simple-minded (*euêthês*). For I know that teachers do teach those letters which each one happens to possess himself, and that harp-players do teach people how to play the harp. As for the second

proof (*apodeixis*)—that there do not in fact exist acknowledged teachers—what in that case do sophists teach if not wisdom and moral excellence (*sophian kai aretan*)?'

On the face of it, the concluding rhetorical question seems to involve begging the question, unless one assumes a strong parallel between the sophistic art and all the other arts where there are acknowledged teachers. With regard to the argumentative strategy here, Robinson[24] notes that the author understands the thesis about the unteachability of virtue in an unqualified sense, so that it can be demolished by the production of counter-cases, which is what the author does: (6.8) 'And what were the followers of Anaxagoras and Pythagoras?' (The implicit assumption being: if not students who learned their wisdom.) 'As for the third proof, Polyclitus did teach his son to make statues.'

It can hardly be a coincidence that the same example is used in Plato's *Protagoras* to support a strong parallel between teaching a craft and teaching civic virtue. But since this parallel must be taken seriously, what implications does it have for the teaching activity of sophists like Protagoras? Within ancient Greek society, so far as we can ascertain, the standard crafts were passed on from father to son, or from master to student, through example and imitation. Presumably, the crucial test of whether the son or student had mastered the craft was whether he could produce goods of an acceptable quality. When this model of teaching is applied to the art of sophistry, one might assume that the evidence for mastery of the craft is the ability of the student to produce arguments of the same kind and quality as the master himself. For this purpose, the imitation and memorisation of opposite arguments such as we find in *Dissoi Logoi* would constitute the learning process. Of course, the most obvious result of such a process is that students will themselves become sophists rather than good citizens. But the objections of Socrates at the beginning of Plato's *Protagoras* provide some evidence that this was a widespread confusion in all sophistic teaching.

III. *Conclusion*

From this comparison of material drawn from Plato's *Protagoras* and the anonymous *Dissoi Logoi*, what conclusions can we draw that have a bearing on my two guiding questions about his *paideia*, namely, what did he teach

[24] Robinson 1979: 213.

and how did he teach it? With respect to his promise to make his students better at managing the affairs of the city, it is plausible to assume that he taught an art of debating which enabled them to argue on both sides of every issue, and also to refute opponents in public debate. This was a very useful skill for young men to learn if they wanted to engage in public affairs, whether in the democratic Assembly or in the Lawcourts. Such a skill at constructing opposing arguments might be illustrated by the anecdote about Protagoras reported by Diogenes Laertius which tells of the time when he demanded his fee from Euathlus, a pupil of his who had refused to pay by saying: 'But I haven't won a victory yet.' Protagoras replied: 'But if I win this dispute, I must be paid because I've won, and if you win, I must be paid because you've won.'[25] I think it is likely that this so-called anecdote is an extract from Protagoras' own treatise, *Trial over a Fee*, since it has the classic format of double argument. In fact, one might easily construct a possible rebuttal for Euathlus as follows: 'If I win then I don't have to pay the fee because of the judgment of the court. But if I lose, I don't have to pay because I have not yet won a victory.'

This type of double argumentation may also have been taught by Protagoras through standard opposing arguments in other treatises, such as *The Art of Debating* (*Technê eristikôn*) and *Refutations* (*Kataballontes*). The students could be encouraged to memorise a few paradigmatic argument-forms and then to invent their own variations to fit different possible issues that a speaker might need to address in the Assembly or Lawcourts. From this perspective we can perhaps make sense of the distorted comic picture of sophistic activity that is to be found in Aristophanes' *Clouds* (112–115): 'They say that both arguments can be found among them, the stronger, whoever he is, and the weaker. Of these two arguments, the one—the weaker—wins out, they claim, by saying what is more unjust.' Furthermore, it takes only a little imagination to discover the sophistic practice of double argumentation lurking behind the comic *Agôn* between the Just and Unjust Arguments that is featured later in the *Clouds* (889–1114).

Finally, let me briefly note the possibility that Protagoras had a primitive theory of teaching, which arises from some reports of his views. For instance, in a work entitled the 'Great Speech' (*Megas Logos*), Protagoras is reported as saying: 'Teaching requires natural endowment and practice' and also 'They must learn, starting young.'[26] Both aphorisms are quite consistent with

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[25] DL 9.56; cf. Aulus Gellius *Noct. Att.* 5.10.

[26] *Anecdota Graeca Parisiensia* 1.171.31 Cramer; *On Hippomachus* B 3 (DK 80 B 3, II.264.20–26).

his reported views in Plato's *Protagoras* and may even be derived from the justification of sophistic education given in that dialogue. However, that is less likely as a source for the nicely balanced maxim reported by Stobaeus: 'Protagoras said that art (*technê*) was nothing without practice (*meletê*), and practice nothing without art.'[27] This maxim bears the trademark of the great rhetorician, who carved out a successful career for himself as an educator, appealing to aristocratic prejudice by admitting the priority of a good nature, while advocating the necessity of teaching and practice for the fulfilment of that natural potential in young men who wished to succeed in public life.

[27] Stobaeus *Anth.* 3.29 (DK 80 B 10).

Introduction

In this paper my specific and limited purpose is to examine the competing models of *paideia* that I find to be implicit in the explicit contrast between rhetoric and dialectic, which is drawn by Plato through the dialogical encounters between Socrates, Gorgias, Polus, and Callicles. In dramatic terms, Gorgias and Polus represent the rhetorical tradition with its own particular *paideia*, while Socrates represents an alternative *paideia* that is promoted through dialectical inquiry. Indeed, throughout the dialogue, Plato underlines many differences between rhetorical display (ἐπίδειξις),[1] which involves a long speech on a set topic, and the Socratic elenchus which involves short questions and answers. For instance, in the opening scene of the dialogue (447a–b), Socrates and Chaerephon have just missed a rhetorical display by Gorgias. Significantly, Callicles promises that it will be repeated at their pleasure because Gorgias is his house-guest.[2] Socrates, however, wants to know (447c) if Gorgias is willing to engage in dialectical discussion (διαλεχθῆναι) about specific questions (but not rhetorical themes) such as: What is the power of his craft (τίς ἡ δύναμις τῆς τέχνης) and what is it (τί ἐστιν) that he professes and teaches? Callicles confidently responds (447c) that Gorgias is always willing to answer questions, and urges Socrates to ask the man himself. Of course, it soon becomes apparent that Socrates and Gorgias have very different ideas about what is involved in asking a question.

With reference to the historical context for this competition between two quite different kinds of *paideia*, we must distinguish between the dramatic date for the *Gorgias* dialogue, which hovers around the end of the Peloponnesian War (perhaps 405 BC), and the date of composition which may be located somewhere in the first quarter of the fourth century BC. Despite

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[1] The term ἐπίδειξις is not being used in the technical Aristotelian sense but rather in a more general sense that covers many kinds of public performance by a speaker; see R. Thomas 2003. There are some good reasons for believing that the historical Gorgias may have applied rhetorical ἐπίδειξις in many different contexts, including the Assembly and the law courts.

[2] By contrast with Socratic discussions, each of which is unique and tailored to the discussion partner, a Gorgianic rhetorical display can be repeated at will and it is also like an item of merchandise which is available to those with the means to pay.

the fuzziness of this temporal perspective, I think we may assume that Plato wants his audience to bear in mind the disastrous Sicilian expedition and its contribution to the eventual defeat of Athens. The historical figure of Gorgias,
[84] as ambassador for Leontini, shared | some responsibility for this disaster because it was he who first seduced the Athenians by means of his rhetoric to become involved in Sicilian politics. It is more difficult to establish any precise historical framework for the date of composition of the *Gorgias* dialogue but I find it plausible to assume that the figure of Isocrates is lurking somewhere in the background. A native of Athens, Isocrates founded a school of rhetoric which continued the tradition of Gorgias and which enjoyed considerable success in Plato's lifetime. Furthermore, from his polemical work *Against the Sophists*, we gather that Isocrates was critical of eristic dialecticians, while also describing his own rhetorical activity and mode of *paideia* in terms of 'philosophy'.[3] Thus I claim that it is quite reasonable to treat Plato's *Gorgias* as part of an ongoing debate in Athens about the best way to train young men for citizenship in the *polis*. Of course, Plato's explicit reference to Pericles and his speeches suggests that he may also be responding to Thucydides, who claimed that Pericles was one of the greatest political leaders and civic educators of Athens.[4]

From a general philosophical perspective, however, I want to draw attention to the importance of *paideia* for ancient political debates, since this topic has been rather neglected by modern scholars ever since Jaeger's work in the middle of the twentieth century. As soon as we realise that the ancient debate about constitutions also involves the question about the best way to live, we cannot avoid the issue of competing models of *paideia* that underlies such constitutional debates. I maintain that this is a crucial perspective which contemporary scholarship needs to recover in order to deal with the civic dimensions of ancient political thought. For instance, I want to suggest that it is within such an educational perspective that we should understand Socrates' ironic remark (448d) that Polus seems to be fully equipped for speeches (λόγους) but that he has not yet fulfilled his promise to Chaerephon. Gorgias seems puzzled by this remark presumably because he doesn't see

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[3] Significantly enough, Isocrates criticizes those who apply the craft analogy to the art of speaking where it is inappropriate because a speech must be appropriate for different occasions, whereas an art like grammar is the same for all occasions. Here the Platonic craft analogy could be the target of his criticism (*Against the Sophists* 12 ff.).

[4] Yunis (1996) makes a very convincing case for regarding Thucydides as one of Plato's targets in the *Gorgias*, even though he is not mentioned by name (any more than is Isocrates). Plato did not often identify his contemporary ideological rivals.

the difference between answering a question and making a speech. Socrates remarks (448d–e) that Polus has had more practice in rhetoric than in discussion (διαλέγεσθαι), with the result that he has failed to answer the question. Socrates explains that, instead of saying what is the art of Gorgias, Polus had praised it by saying that it is the finest. But this represents an answer to a question about the quality (ποία) of the art rather than what name we ought to call it, i.e. what it is.[5]

I. *Rhetoric and Dialectic* [85]

In the dramatic preliminaries to the dialogue, when Socrates and Chaerephon first encounter Gorgias and Polus, it is noteworthy that the question about the character of rhetoric as a *technê* is given prominence. For instance, there is a preliminary dialogue between Chaerophon and Polus in which the latter fails to address the leading question about what is this τέχνη, but instead praises the discipline practised by Gorgias. Indeed, Polus may be seen as a typical product of Gorgianic education in rhetoric, so that his subsequent questioning by Socrates involves a critical assessment of such *paideia*, in contrast with dialectical *paideia*. There is no product from the latter *paideia* on view in the dialogue, though we might treat the dialogical encounter between Socrates and Polus as a failed attempt at such instruction.

However, it is clear from his reference to Homer that Gorgias is being presented as the self-conscious inheritor of the poetic tradition of *paideia*, which was the dominant mode of initiation into Greek culture for young aristocratic men. Plato's challenge to this dominant *paideia* is formulated as the question of whether or not rhetoric qualifies as a craft like other crafts such as medicine, which involved some kind of scientific knowledge. Even if Plato himself later began to harbour doubts about the craft analogy, still in the *Gorgias* he uses it as a kind of strait-jacket to limit the claims of rhetoric to be a craft. For instance, if Gorgias were to hold his discipline to be a craft, then he should be able to distinguish its subject-matter from that of other crafts which operate through λόγοι (449d ff.).

In point of fact, however, one might wonder whether the historical Gorgias actually claimed that rhetoric is a craft, given that Plato is the first to have described it in these terms. But, within the eponymous dialogue, Gorgias is

[5] On the logical priority of the 'what is it' question over 'what is it like' (ὁποῖόν τι), see *Meno* 71b; *Prot.* 360e, 361c: teachability of virtue.

made to accept the terms of reference for the discussion, so that he offers a description of rhetoric in terms of political affairs as a craft of persuasion by means of speeches. Indeed, Gorgias praises rhetoric as the art of a freeman who is able to rule over others for his own benefit. From such boastful advertising one can get some idea of why rhetorical expertise was a valuable commodity that was eagerly sought after in ancient Athens by ambitious aristocrats like Callicles. The ability to speak persuasively in public was crucial for success in the Assembly and the law courts where most of the key political decisions were taken (452e). This historical reality is attested to by Thucydides and other witnesses to the practice of Athenian democracy. Indeed, the educational role of Pericles as leader of the *demos* is put in question by Plato later in the *Gorgias*, despite the glowing reports about his wise leadership given by Thucydides. Thus it is not implausible to read Plato as questioning the judgment of Thucydides about the success of Pericles as a political leader precisely on the grounds that he failed as a civic educator.

[86] But let us leave such historical speculations and return to a close analysis of the *Gorgias* dialogue for evidence of competing models of civic education. One of the major differences between rhetoric and Socratic dialectic, which is underlined throughout by Plato, is that the first proceeds by means of long speeches, whereas the second works through short questions and answers.[6] For instance, Socrates remarks that Polus has been trained in making speeches, so that he finds it difficult to follow the proper order of dialectical questions, and he often runs together different questions. It becomes clear from the dialogue that the obtuseness of Polus is partly due to his rhetorical education, since Gorgias makes the same mistakes in asking and answering questions (461d, 453c). Despite his apparent readiness to answer questions, Gorgias in fact uses a question merely as a stepping-stone into a long speech on a prepared topic rather than as the first step on the way to a dialectical inquiry.

In general, Gorgianic rhetoric is monological rather than dialogical. Although it requires an audience, yet the listeners are mere passive receptors for the persuasion produced in their souls by means of rhetorical speech. Thus the rhetorical education which Polus received from Gorgias probably

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[6] In *Protagoras* 329b, 334e–335c there is a similar contrast between the long speeches of Protagoras and the short questions and answers of Socrates, who ironically confesses that he cannot master the long speech. When he invites Protagoras to engage in question-and-answer, the latter is reluctant to concede ground to an opponent in a public ἀγών. Subsequently, 336b–d, Alcibiades draws attention to Protagoras' agonistic technique of avoiding the issue by responding to questions with a long speech.

consisted of learning how to compose persuasive speeches for different kinds of audiences, based on the common opinions shared by each particular group. For instance, when speaking before the *demos* in the Assembly, the rhetorician must appeal to democratic sentiments if he wants to be persuasive, while he must appeal to quite different sentiments in front of an aristocratic audience. As Socrates puts it, this means that a rhetorician is concerned with persuasion about matters of belief (πίστις) rather than of knowledge (454e). Furthermore, the rhetorician is operating under strict time constraints in trying to persuade a large audience, which can hardly be induced to accept unfamiliar views in a short time. So the most effective rhetorical approach is to discover what the audience already believes and to use these opinions in composing a persuasive speech that leads the hearers to the desired conclusion or decision. By contrast, Socratic dialectic is a more leisurely practice that aims to persuade a single interlocutor about a matter of knowledge and without time constraints, as Plato shows in the *Gorgias*.

The most obvious implication for rhetorical modes of education is that orators will be taught how to make persuasive speeches in front of different audiences. Thus the main emphasis will be placed on discovering effective techniques of verbal persuasion in public fora. Where the culture is primarily oral, as in the case of ancient Athens, these techniques will frequently be derived from the poetic tradition, as we can see from the extant fragments of Gorgias himself, which | belonged to highly stylised prose works. By contrast, [87]
the mode of education that is implicit in Socratic inquiry can be teased out of Plato's *Gorgias* through the comparisons which he draws with rhetoric. The most obvious difference is the method of short question and answer which is adopted by Socrates in opposition to the long speeches of Gorgias and Polus.[7] This method implies that only a single interlocutor is to be persuaded on the basis of his own firmly held beliefs rather than the common opinions of a group. There is also a great deal of emphasis on the internal consistency of the interlocutor's beliefs, since the Socratic elenchus thrives on internal contradictions. Like poetry, rhetoric functions most effectively at the level of conventional or surface meaning, where the audience is enchanted by words and is carried along on a tide of emotion. By contrast, Socratic dialectic refuses to accept the surface meaning of language and tries instead

[7] But Gorgias also claims at 449c to be proficient in question and answer, so that raises the issue of the key differences between his 'method' and that of Socrates. In the end, as Aristotle suggested later, it might come down to the matters of intent (e.g. seeking the truth rather than means of persuasion) and character, e.g. friendly rather than competitive.

to interpret through critical questioning the deeper meaning or intention of the speaker. Thus the Socratic elenchus is an effective instrument for detecting inconsistencies in the beliefs espoused by the interlocutor.

In general, therefore, Socratic inquiry involves an examination of one's whole way of life, especially of the harmony (or disharmony) of word and deed. It is a mode of inquiry that thrives on ἀπορία, in as much as questions about the best way to live arise out of conflicts between the personal beliefs of an interlocutor. The resulting puzzlement on the part of an interlocutor (and of Socrates) is an essential feature of Socratic inquiry because ἀπορία provokes a genuine inquiry into truth. Thus Socratic inquiry, according to Plato, is oriented towards truth rather than common opinion, and it does not face artificial limits like the water-clock in the law courts or the impatience of the *demos* to reach a decision in the Assembly. Socratic dialectic involves cooperative inquiry that is open to truth, whereas rhetoric is competitive speaking whose goal is successful persuasion (457c ff.). Even the task of finding a general definition of rhetoric belongs to Socratic dialectic, since rhetoric does not put itself in question. The implication is that rhetoric is not self-critical or reflective on its own activity by contrast with Socratic dialectic, which is always held open to challenge, as Socrates frequently emphasises to Polus.

Rhetoric is a morally neutral technique of persuasion, by contrast with dialectic, which is a morally committed inquiry about the best way to live. For instance, Gorgias disclaims responsibility for the abuse of rhetoric by his students, but that seems incompatible with the admission that he teaches ἀρετή. Even if this admission is historically unfounded, it is still significant that Plato represents Gorgias as being sufficiently bound by conventional morality that he is ashamed to concede that he would not teach ἀρετή
[88] to any student who lacks it. Of course, a | great deal depends on what is meant by ἀρετή in this context, and it is plausible to assume that Gorgias would have viewed it in terms of some instrumental rationality that leads to political success within the city. By contrast, Socrates seems to regard ἀρετή as an end in itself which is achieved through dialectical inquiry into the best way to live for human beings. Such an inquiry is not only a means of reaching objective truth about human excellence but is also constitutive of the best human life, as exemplified by the life-activity of Socrates himself, which appears strange and paradoxical from the perspective of common opinion.

Thus Plato draws a clear contrast between rhetoric, which is persuasive with respect to opinion (πίστις), and dialectic, which is instructive about

knowledge (ἐπιστήμη). Yet he cannot deny the historical reality of sophistic modes of instruction as practised by Gorgias and as employed politically by Pericles, whom Thucydides praised for instructing the citizens through his speeches. Therefore, the contested question is whether rhetoric or Socratic dialectic proves to be the best form of political education. In general, Plato uses the ideal of unity and harmony of a political community as a standard for judging what constitutes genuine political education. This is why Socrates is made to challenge the claim of rhetoric by calling it a semblance (εἴδωλον) of a branch of politics by analogy with cookery which mimics medicine. He calls it flattery (κολακεία) and regards it as disgraceful (αἴσχρον) because it aims at what is pleasant rather than at what is best. So rhetoric does not qualify as a τέχνη because it cannot give a rational account of the real nature of things, and cannot specify a cause (465a–b). By contrast, dialectic can give rational accounts and can specify causes, as illustrated by Socrates' readiness to give an account of his own practice of argumentation.

II. *Lessons in Socratic Dialectic*

I propose that we should regard the dialogical encounter between Socrates and Polus as an illustration of the kind of educational practice that flows from the Socratic dialectical method, even though it results in failure when applied to Polus. The encounter begins with Polus accusing Socrates of tricking Gorgias into a merely verbal refutation by shaming him into a concession that he shouldn't have made. Using conventional moral terms, Polus describes Socrates' behaviour as boorish (ἀγροικία) and he charges him with delighting in refutation for its own sake. Obviously, Polus views the Socratic elenchus as being agonistic in character, and as being practised for the sake of victory. So this is the challenge which Socrates must answer if he is to provide an alternative account of the function and purpose of dialectical inquiry.

In his initial response (461c) Socrates draws attention to the revisability of dialectical argument, if any partner to the dialogue can show that some conclusion | has been accepted in error. When he warns Polus against indulging [89]
in his habit of making long speeches, he is drawing an implicit contrast with rhetoric, which is closed to critical examination. Significantly, Polus protests at not being free to say as much as he likes, especially in democratic Athens where such freedom was the privilege of every citizen. Rather ironically, Socrates promises that he will not infringe on such democratic freedom but remarks that he will exercise his own freedom to depart if Polus attempts to make long speeches.

I see the educational experiment beginning at *Gorgias* 462a where Socrates suggests to Polus that, if he has any concern for the argument (since he protested against the refutation of Gorgias), he should engage in the activity of questioning and answering. This would involve either learning to ask the right questions or to answer questions in the right way. Polus chooses the active role of putting the questions, presumably because he sees this as a dominant role which gives him a better chance of victory. Due to his lack of experience in Socratic dialectic, however, he is a failure at leading the conversation. For instance, he begins by inviting Socrates to give his own account of rhetoric as an alternative to that of Gorgias. In response, Socrates first helps him to reformulate this as a question about what sort of art rhetoric is, before answering that it is not an art at all, and then describing rhetoric as an empirical routine (ἐμπειρία) of producing a certain kind of gratification and pleasure. Despite this negative description of rhetoric, Polus persists in his conviction that it is something fine (καλόν) and this is due partly to his different moral orientation and partly to his failure to learn the lessons of Socratic dialectic. Socrates continues to supply appropriate questions for Polus, who turns out to be a very poor student of the art of leading a dialectical conversation. For instance, as Socrates points out (463b–c), one cannot ask whether rhetoric is something fine until one first asks what it is. This is the same mistake about the proper order of dialectical questions already committed both by Polus and Gorgias.

At this stage, however, Socrates is already (462d) putting questions into the mouth of Polus (What art is cookery?) and answering them himself (None at all but a kind of routine (ἐμπειρία) of producing gratification and pleasure). From such answers Polus wrongly assumes (462e) that Socrates takes cookery and rhetoric to be the same thing. Socrates corrects this misconception by calling them parts of the same practice but remains coy about naming it, ostensibly out of concern for Gorgias, who might take him to be making fun of his own practice (of rhetoric). Pretending (463a) not to know exactly what kind of rhetoric is practised by Gorgias, Socrates claims that what he himself calls rhetoric is part of a practice he calls 'flattery' (κολακεία) and which he describes as a shrewd gallant spirit which has a natural bent for clever dealing with mankind.[8] This generic practice has many species, including cookery,
[90] which is not an art but rather a | kind of routine (ἐμπειρία) or knack (τριβή). The other species or parts (μόρια) include rhetoric, cosmetics, and sophistry.

[8] Norlin, in his Loeb translation of Isocrates, notes that at *Gorgias* 463a Plato is parodying the Isocratean account of rhetoric at *Against the Sophists* 16–17.

Socrates corrects (463b–c) Polus' method of asking questions as follows: one cannot ask whether rhetoric is a fine thing until one first asks what it is (τί ἐστιν). So he urges Polus to ask him what sort of branch of flattery rhetoric is, and the answer he gives is that it is a semblance (εἴδωλον) of a branch of politics (πολιτικῆς μορίου, 463d1–2). It seems clear from these exchanges that Socrates is trying to educate Polus in the right order of asking questions in dialectic.

As if to underline the ineptitude of Polus, Gorgias briefly (463e) takes over the conversation, while dismissing Polus as being of no account, after Socrates had described him as being like a young colt (πῶλος). Gorgias has been drawn back into the Socratic conversation by his puzzlement over the previous description of rhetoric as a semblance of a branch of politics. Apparently, he is not simply defending his own livelihood, but is driven by a genuine desire to find out what Socrates means by such a description. Faced with such incomprehension on the part of both Gorgias and Polus, Socrates is forced to depart temporarily from his method of question-and-answer to give a relatively long speech, by way of clarification for his description of rhetoric. But he explains (465e) that such speeches are allowed only when dialogue fails, and insists that they are no substitutes for question-and-answer. In addition, they are not the same as rhetorical speeches because they are held open to challenge by the listeners, while the speaker must be ready to give reasons for the views expressed (465a–b).

Resuming his education in dialectical question-and-answer, Polus rejoins (466a) the conversation by asking: Do you take rhetoric to be flattery? Socrates reminds him that he had called rhetoric a branch (μόριον) of flattery, and chides him on his bad memory for previous answers.[9] Polus then asks Socrates whether he thinks that good orators (ἀγαθοὶ ῥήτορες) are considered to be flatterers (κόλακες) in their own cities and thus worthless (φαῦλοι). Socrates wonders if Polus is asking a question or beginning a speech. In reply to Polus' question, he insists they are not honoured (νομίζεσθαι) at all. Polus is astounded at this reply and exclaims (rhetorically): Have they not the chief power in their cities? Socrates denies this, in the sense of power as something good (ἀγαθόν τι) for the one who has it. Polus confirms that this is what he means but Socrates claims that in this sense the orators have the least power of all people in the city. Once again, Polus is perplexed and exclaims (466c): Are they not like despots (τύραννοι) in putting to death anyone they please,

[9] This is an important pedagogical point; cf. *Phdr*. 276d, *Hipp*. *Mi*. 369a, *Ion* 539e, *Rep*. 487a, *Ep*. VII, 344a.

and depriving anyone of their property and expelling them from their cities, just as they please (ἂν δοκεῖ αὐτοῖς)? And, once more, Socrates expresses doubt as to whether Polus is asking a question or simply declaring his own opinion
[91] (γνώμην σαυτοῦ). In this way, Plato clearly | indicates that Polus is making very little progress in learning how to ask dialectical questions, instead of making rhetorical speeches.

For instance, Polus claims that he is asking a question but Socrates points out (466c) that, in fact, he is asking two questions at once. Plato is here drawing attention to an important skill in Socratic dialectic, namely, distinguishing between different questions. Polus had asked whether it was not the case that orators put to death anyone they wish, just like tyrants, and deprive people of property and expel them from their cities. Socrates agrees that orators do such things, which they consider to be best (ἂν αὐτοῖς δόξῃ βέλτιστον εἶναι) but (in answer to the second question) he thinks that they have the least power in their cities, since they do nothing that they wish to do (ὧν βούλονται). Thus Socrates challenges Polus to demonstrate (ἀπόδειξις) that orators have intelligence (νοῦν ἔχοντας) and that rhetoric is an art, not flattery, thereby refuting Socrates' previous argument. But, if that argument remains unrefuted (ἀνέλεγκτον), it implies that orators who do what they see fit (ἃ δοκεῖ αὐτοις) in cities, just like tyrants, will find that they obtain no good thereby, since doing what one sees fit without intelligence is an evil (κακόν), as Polus had admitted. Thus, according to Socrates' argument, the paradoxical conclusion is that orators and despots cannot have great power in their cities.

Polus is (467b) completely incredulous at this conclusion, but Socrates challenges him to demonstrate that the orators do what they wish (ἃ βούλονται). Polus recalls that Socrates admitted that they do what they think best (ἃ δοκεῖ αὐτοις βέλτιστα) and he thinks this is the same as doing what they wish, but Socrates rejects this identification. Polus declares (467b–c) these to be shocking (σχέτλια) and monstrous (ὑπερφυή) conclusions, but Socrates urges him to spare his invective, while ironically mocking his rhetorical style by addressing him as 'O peerless Polus'.[10] Instead, he invites Polus to refute him or be refuted himself by answering. Again, Plato is referring to the rules of the game of dialectic, by implicit contrast with the use of rhetorical invective to win a public debate. In Socratic dialectic, it is the agreement of

[10] *Gorgias* 467c: ὦ λῷστε Πῶλε. The assonance of the phrase may be taken as a mocking allusion to the nicely balanced clauses and jingling phrases which Polus copied from his master Gorgias.

the interlocutor which is essential, not the persuasion of an audience. Finally, Polus consents (467c) to take his turn answering questions, so that he may discover what Socrates means. The key point being made here seems to be that intellectual curiosity may bring people over to dialectic from rhetoric, given that rhetoric functions at the level of common opinion and is upset by paradox. For instance, Polus was shocked by the philosophical notion that people might do as they wish (subjectively) and yet not achieve what they want (objectively) in the sense of attaining some good. This reminds us of the familiar Platonic theme that puzzlement in the soul is what spurs it to engage in philosophy.[11]

III. *Contrasting Modes of Refutation* [92]

At *Gorgias* 468d Socrates recaps what has been agreed (ὁμολογοῦμεν) so far in the argument: if a man puts anyone to death (or expels him or deprives him of property), whether he does so as a tyrant or orator, thinking it better (ἄμεινον) for himself, though it is really worse (κάκιον), that man does what he thinks fit (ποιεῖ ἃ δοκεῖ αὐτῷ). But that is not the same as what he wishes (ἃ βούλεται), assuming that it is really bad (κακὰ ὄντα). Polus is reluctant to answer, but agrees that such a man does not do what he wishes. Thus, Socrates argues (468e) that that man cannot be said to have great power (μέγα δύναται) in the city, if that is something good (ἀγαθόν τι), as Polus had previously admitted. Socrates declares it as true that it is possible for a man to do what he thinks fit in a city and yet not to have great power to do what he wishes.

Perhaps out of defensiveness, Polus (468e) adopts an *ad hominem* mode of argument against Socrates by claiming that, if he had the chance, then he too would take the liberty of doing what he thinks fit in his city. He suggests that Socrates would envy a man who had the power to put someone to death as he thought fit, or deprive him of property, or put him in prison. Subsequently (469c), when Socrates is asked whether he would not accept the power of a despot (τυραννεῖν), he denies that he would accept power in this sense. Polus explains that what he means by a despot's power is the liberty of doing anything one thinks fit (ὃ ἂν δοκῇ αὐτῷ) in one's city, i.e. putting people to death, expelling them and doing everything at one's own discretion (πάντα πράττοντι κατὰ τὴν αὐτοῦ δόξαν). Socrates now (469c–d) begs leave to make a

[11] Cf. *Rep*. VII, 523 ff.

longish speech by way of explanation for his own view, while also providing illustrative examples. This departure from Socratic dialectical method is necessary because Polus is not getting his point by means of question-and-answer.

After telling an illustrative story, Socrates sums up the view of Polus as follows: if doing what one thinks fit is attended by advantage (τὸ ὀφέλιμον) in doing it, this is not merely a good thing (ἀγαθόν τι) but also involves having great power (μέγα δύναται); otherwise it is a bad thing and involves having little power. Socrates recalls a previous admission (ὁμολογοῦμεν), i.e. that sometimes it is better to do those things such as putting people to death and sometimes not depending on whether it is just or unjust. So the question is where to draw the line. At this point (470b–c), Polus refuses to answer and invites Socrates to answer his own question. Socrates replies that he thinks it is better (ἄμεινον) when these things are done justly (δικαιῶς), and worse (κάκιον) when they are done unjustly (ἀδικῶς). Presumably the dramatic point of having Socrates answer the question himself is that Polus is unable to see the point of such a distinction.

Polus now responds (470c) with heavy sarcasm that even a child (παῖς) could refute Socrates, and he cites as evidence the example of Archelaus, king
[93] of Macedon, | who was a generous patron to many poets and sophists. In a long speech (471a–d) that is full of irony, Polus refers to Archelaus as a prodigy of wretchedness, who had done enormous wrong in order to gain the throne. Polus concludes with an appeal to the common opinion of most Athenians, who would readily change places with Archelaus. In his reply (471d) Socrates is equally ironic in complimenting Polus on his excellent training in rhetoric (εὖ πρὸς τὴν ῥητορικὴν πεπαιδεῦσθαι), though he has neglected disputation (τοῦ δὲ διαλέγεσθαι ἠμεληκέναι). Polus imagines that he has refuted Socrates by appealing to common opinion, but Socrates himself has not admitted a single point (οὐδὲν ὁμολογῶ). By way of riposte, Polus claims (471e) that Socrates does not want (οὐκ ἐθέλεις) to agree, though he secretly agrees with common opinion.

However, Socrates points out (471e) that their misunderstanding is due to the fact that Polus has tried to refute him in the rhetorical fashion (ῥητορικῶς) in which refutation is understood in the lawcourts. According to this legal model, one party is supposed to have refuted the other when they bring forward a number of reputable witnesses (μάρτυρας) to any statement they make, while their opponent produces only one or even none. However, although the weight of numbers counts in court, it does not do so in the Socratic elenchus. Socrates objects (472a) that this rhetorical kind of refutation is quite worthless for getting at the truth (πρὸς τὴν ἀλήθειαν), since

sometimes a man may actually be crushed by the number and reputation (δοκούντων) of the false witnesses against him. Socrates concedes that Polus will find most Athenians to be in agreement with him, if he calls them as witnesses against the truth of what Socrates claims. But Socrates emphasises (472b) that he alone refuses to admit the truth of this view, since Polus has not convinced him, and so has not refuted him (by the rules of the elenchus). Polus mistakenly believes that, by producing false witnesses against him, he will be able to expel him from his property, the truth (472b6–7). By contrast, the Socratic elenctic procedure depends on producing only one witness to the truth, i.e. the interlocutor. Thus Socrates must either persuade Polus of the truth of his claims, thereby refuting Polus' view; or else Polus must persuade Socrates, thereby refuting him. The predominant common opinion carries little weight in the game of the Socratic elenchus, whose logic demands that the interlocutor be convinced.

In this way, Socrates contrasts (472c) the two different types of refutation: the legal or rhetorical refutation which depends on the weight of common opinion; and the Socratic refutation which depends on the rational persuasion of only one other person, namely, the interlocutor. The points at issue are also of the greatest importance, about which it is most honourable (κάλλιστον) to know and most disgraceful (αἴσχιστον) not to know, namely, who is happy (εὐδαίμων) and who is wretched. Polus thinks it is possible for a man to be happy while doing wrong, as his example of Archelaus shows, since he is a wrongdoer yet generally regarded as happy. By contrast, Socrates claims that this is impossible, and this is one clear point of dispute. The second issue is about whether a man can be happy | in wrongdoing, if he [94] suffers retribution (δίκη) and punishment (τιμωρία). Polus thinks this is not possible, as the man would then be the most wretched (ἀθλιώτατος), but if he escapes retribution, he will be happy. By contrast, according to Socrates, the wrongdoer (ὁ ἄδικος) is wretched (ἄθλιος) in any case, but even more wretched if he does not pay the penalty, though less wretched if he pays the penalty and finds requital (δίκη) from gods and men. This summary by Socrates of the disputed issues represents a constructive use of dispute in the dialectical pursuit of truth, by contrast with its negative use in eristic rhetoric.

Socrates points out (473d) that Polus is adopting the tactics of telling scare stories and calling many false witnesses, but he reminds him that he has already conceded that the despot is 'criminally' (ἀδικῶς) plotting a tyranny. According to Socrates, neither successful nor failed tyrants can be happy, but he holds that whoever goes scot-free and establishes himself as a despot will be more wretched. This seems so strange to Polus that he bursts out laughing, but Socrates reminds him that laughing something down

does not constitute a refutation.[12] Polus (473e) is convinced that no one in the world would assent to such paradoxical claims and that Socrates is therefore refuted. But Socrates points out (474a) that he is not a politician, as he illustrates by telling about his incompetence in putting something to a vote when he was President of the Council.[13] So he does not seek the consent of the crowd, but rather he wants to produce one witness, namely, the interlocutor who must agree to the truth of the claims. Thus he proceeds with his attempt to convince Polus through dialectical argument, while neglecting the larger target audience for rhetorical persuasion. Plato is here pointing to what he regards as a crucial historical difference between the educational activity of Socrates, and that of sophists and rhetoricians. Whereas the sophists generally represented themselves as experts in civic education for a democratic *polis*, Socrates conducted his conversations in private with interlocutors on an individual basis, while shunning political engagement either in the Assembly or lawcourts.

But let us return to his elenctic inquiry, where Socrates (475d) recalls a previous admission by Polus that doing wrong is more disgraceful (αἴσχιον) than suffering it. This implies, by the previous argument, that it is also more evil (κάκιον). So Polus seems to be committed to accepting the greater evil and what is more disgraceful, i.e. doing wrong rather than suffering it. Given his apparent reluctance, Socrates urges Polus to answer and encourages him to submit himself bravely to the argument, like a patient submitting to a doctor and taking his medicine, as it will not harm him (οὐδὲν βλαβήσῃ), but rather cure his soul. Here Plato seems to use a therapeutic model for elenctic argument as care of the soul by relieving it of error. Socrates appears
[95] to be diagnosing and trying to cure | disease-like disorders of the soul, since inconsistency is taken to be a malfunction in the agent's rational and emotional powers. Thus Socrates exhorts Polus to submit himself nobly to the argument, as he would to a doctor, by answering either yes or no. At last (475e), Polus accepts that he would not choose the greater evil of doing wrong, as the argument has shown. But Socrates emphasises (475e) the truth of this conclusion, that neither Polus nor anyone else in the world would choose to do wrong rather than suffer it, since it is really more evil (κάκιον). Polus agrees and Socrates again draws attention (475e–476a) to the difference between forensic and dialectical refutation. Polus may have on his side the

[12] Perhaps this refers to the mockery of Socrates in *The Clouds* of Aristophanes.

[13] In fact, he refused to put something illegal to a vote, i.e. trying all the generals as a group for failing, due to bad weather, to pick up the dead after the sea battle of Arginusae.

agreement of everyone else except Socrates, but Socrates is content with the single assent or witness of Polus, whose vote he counts only and disregards the rest.[14]

Conclusion

Some further implications of Plato's contrast between different models of *paideia* in the *Gorgias* emerge later when Socrates engages in discussion with Callicles, an Athenian citizen who has invested in rhetoric in order to promote his own political influence. Callicles is prepared to concede that Socratic dialectic is a fine and liberal (ἐλεύθερος) accomplishment for young boys but he insists that it is not a serious pursuit for a grown man who wishes to be influential and respected among his peers within the *polis*. For this reason, Callicles urges Socrates to put aside his dialectic and to move on to greater things, namely, political affairs (484c–d). He warns Socrates that if he persists in his private conversations with young boys, while neglecting public business, then he is leaving himself open to political ruin. He will remain ignorant of everything he ought to know as a gentleman (καλὸν κἀγαθὸν) and as a reputable (εὐδόκιμον) man of affairs, namely, the laws of the city, and the speeches to be used in negotiating agreements either in private (ἰδίᾳ) or public affairs (δημοσίᾳ). In addition, he will remain inexperienced in men's characters because he is unacquainted with the pleasures and desires that drive them to act in the public sphere. Consequently, when such an inexperienced person tries to engage in either private or public business, he will look ridiculous (καταγέλαστον), just as the man of affairs would look ridiculous if he tried to dabble in philosophy.

In order to draw the contrast more generally, Plato makes Callicles refer to the debate in Euripides' *Antiope* between Zethus and Amphion, who represent the public and the private spheres, respectively. Thus for Plato the debate about modes of education also involves different ways of life, namely, the life of the democratic politician, which is oriented to success in the public affairs of the | *demos*, as against the life of the philosopher, which involves [96]
privately caring for the soul. In the *Gorgias* (519d–520a), at any rate, this is how Plato seeks to frame the debate about competing modes of education, though the framework shifts in the *Republic* and the *Laws* to the construction

[14] We might note the anti-democratic bias of elenctic method vs. the demotic character of rhetorical proof or persuasion.

of the best *polis*. Indeed, this alternative political framework for the debate about education appears to be anticipated in the *Gorgias* (521d–522a) with the rather paradoxical claim that Socrates is the only genuine politician in Athens, though he has never participated actively in democratic politics. However, while hinting at the historical fate which he suffered, the dialogue remains pessimistic about the possibility of Socrates reforming the Athenian *demos* by means of his dialectical mode of civic education.

Introduction

It is generally accepted that Erôs is a central theme of Plato's *Symposium*, but it is not so obvious that the topic of *paideia* is equally central to the dialogue, such that one can claim that 'erotic paideia' serves as one of its leitmotifs. Hence textual evidence combined with interpretive argument is required to make the case, and that is what I propose to do in this paper. Among the many functions which the symposium as an institution served within classical Greek society, a central one was the social initiation of young aristocratic males by older men. Pederasty was tolerated and even regulated in the ancient Greek polis because it promoted class solidarity, as well as being conducive to military valour. So it was no accident that the practice of pederasty was widespread within the military barracks in ancient Sparta, which was subsequently outdone by Thebes with its so-called 'Sacred Band'. Thus within ancient Athens a primary locus for pederastic activity was the gymnasium, while another was the symposium as a social institution that provided a traditional kind of civic education.[1]

However, Plato was not an uncritical admirer of pederasty, as is clear from the *Republic* and *Laws*, but in the *Symposium* he tries to show how it can serve a higher purpose if it is directed in the right way towards more spiritual goals. I want to argue that describing such redirection is the chief purpose of Socrates' report on the lesson of Diotima, which also involves a dialogue between teacher and student. This educational exchange succeeds because the preliminary refutation of Socrates helps to free him from mistaken assumptions about Erôs and thereby enables him to transcend his attachment to particular erotic objects. By contrast, I claim that the subsequent encounter between Alcibiades and Socrates is designed by Plato to show how erotic *paideia* can fail in the case of someone who is unable to transcend his erotic attachment to particular persons and his powerful desire

[1] For the Greeks, the symposium served as a milieu for celebrating manly *aretê*. For instance, the educational maxims of Theognis (239) were composed to be sung at such banquets, while Xenophanes (Fr. 1 Diehl) says that the symposium is the place for keeping alive the memory of true *aretê*.

for popular success. Just as Callicles in the *Gorgias* is in love with Demos, so also Alcibiades is in love with Socrates but yet is unable to make the ascent to the Good and the Beautiful that is described in the speech of Diotima.

I. *Questioning Agathon*

After Agathon's 'amazing' (*thaumastos*) speech, Socrates confesses (198b–c) himself to be at a loss. He praises the beautiful language of the speech,
[34] but he then exposes its contents | to refutation. In effect, Socrates reveals the speech of Agathon to be a typical rhetorical exercise in which style takes precedence over substance, so that it fails to say anything essential about the nature of Erôs. Socrates ironically confesses that he thought one should tell the truth about everything in an encomium, while picking out from these truths the most beautiful (*kallista*) things and arranging them in the best way. The rhetorical approach, by contrast, involves attributing the greatest and most beautiful characteristics possible to the thing being praised, irrespective of whether or not it is true. Consequently, Socrates invites Phaedrus to choose whether he wants to hear the truth (*t'alêthê*) being told about Erôs in whatever way seems right to Socrates. In this way, Socrates sets the terms for his own dialectical speech, which is clearly marked off from previous rhetorical speeches.

With the permission of Phaedrus (the father of the *logos*), Socrates begins by questioning Agathon on the contents of his beautiful speech in which he had promised first to show (*epideixai*) the sort of character which Erôs has (*hopoios tis estin*) and then to proceed to what it produces (*ta erga*). Socrates approves of this procedure of first specifying the nature of something and then stating its effects. Here we find some indications of the proper order of inquiry in dialectic. It is noteworthy that not only this part of Socrates' contribution but also a significant portion of his report on Diotima's teaching follows the question-and-answer format, in which Socrates replaces Agathon as the respondent. Indeed, we are presented with a younger Socrates who ostensibly had made the same mistaken assumptions about Erôs as did Agathon, and which were corrected by Diotima. In short, as Christopher Rowe (1998) has rightly noted, Socrates speaks his piece in a rather special way, which has more in common with his own preferred method of conversation (*dialegesthai*) than with the set speeches of the other contributors, even if it reaches a predetermined conclusion. But I want to show how the process of erotic *paideia* involves dialectical

question-and-answer as an indispensable method for philosophical inquiry, which itself is a manifestation of intellectual desire prompted by awareness of a lack.

In brief, the elenctic argument goes as follows (200c): (a) Love is *of* certain things and (b) it is of whatever is lacking (*endeia*) in those who desire or love something. Socrates now (201a) reminds Agathon that he had said that divine activities came about through love of beautiful things (*erôta kalôn*), since there is no love of ugly things (*aischrôn*). From this claim Socrates draws the implication that Love is of some beauty which it does not possess, so that Agathon cannot be correct to claim that Love itself is Beautiful (*kalon*). Agathon complacently admits (201b10–c1) that he didn't know (*eidenai*) what he was talking about, even although he spoke beautifully. Socrates continues with his questions: Isn't the good also beautiful? If so, then Erôs lacks the good, since he lacks the beautiful. While Agathon concedes defeat to Socrates, the latter insists that it is not himself but rather the truth (*alêtheia*) which is difficult to resist. Here a clear contrast is drawn between the personal competition involved in rhetoric and the search for impersonal truth in dialectic.

Rowe (1977: 172) sees this as a crucial test case for Socrates' sincerity in his discussion with Agathon because, if Dover (1974) is right, this claim is so much hot air. If Socrates really were to have no more concern for the truth than Agathon, this would jeopardise one of the main theses of the *Symposium*, about the difference between poetry/rhetoric and Socratic/Platonic philosophy. Rowe thinks that the important issue is the quality of the argument, which he finds to be pretty high. Agathon accepts that he didn't know what he was talking about but thinks the problem is that Socrates is a better debater, though the latter insists that he merely represents the impersonal truth of the matter. Rowe suggests that Agathon is dropped by Plato because he is an inadequate partner for Socrates in philosophical discussion but I want to go further by suggesting that he is incapable of taking the next step in erotic *paideia*, even after | becoming aware of his ignorance about Erôs, [35]
because his personal vanity predisposed him to play the part of a beloved rather than that of a lover. Furthermore, his awareness of being refuted by Socrates does not provoke him to engage in further inquiry about Erôs, so it would appear that he lacks the characteristic desire to learn the truth which belongs to a philosophical nature.

II. *Socrates as Budding Philosopher*

Socrates now (201d1) begins his report on the account of Erôs received from Diotima—a wise woman or prophetess who had taught him about erotics (*erotika edidaxen*). But what has already been agreed with Agathon remains in place, when Socrates undertakes to give a report of his conversation with Diotima.[2] Once again, he emphasises the proper order of inquiry: one should first say who Erôs is, and what character he has, before saying what he does. Socrates remarks (201e) that it seems easiest (*rhaston*) to proceed with describing Erôs through close questioning in the manner of Diotima. But it is not obvious on the face of it that this is the best or easiest way to proceed, so perhaps some clarification can be found by examining the procedure itself. For instance, there is an important similarity between the views of young Socrates and of Agathon: Socrates responded to Diotima's questions, just as Agathon had answered Socrates, i.e. by saying that Erôs was a great god (*megas theos*). Diotima then set about refuting Socrates by means of the same arguments he himself used against Agathon in concluding that Erôs was neither beautiful nor good.

The first step is to establish that there is something in the middle between knowledge and ignorance, just as between the beautiful and the ugly, since Socrates had been assuming that these are exclusive and exhaustive opposites. He admits to making that assumption, which is then examined by Diotima, using the example of knowledge and ignorance as opposites. Her objection is that there is something in between (*metaxu*) wisdom and ignorance (*sophias kai amathias*), namely correct opinion (*orthê doxa*). She argues as follows (200a5): having correct beliefs, even without being able to give a rational account (*logon didonai*) of them, is neither knowing (*epistasthai*)—since how could something irrational (*alogon*) be knowledge (*epistêmê*)—nor is it ignorance (*amathia*), for how could something that hit on what is the case be ignorance? Thus correct belief lies between knowledge and ignorance.

By implication, therefore, something that is not beautiful is not necessarily ugly. In the case of Erôs, though it is admitted not to be good or beautiful, yet it is not to be supposed ugly or bad, but rather something between these two things. However, Socrates objects that Erôs is agreed (*homologeitai*)

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[2] This conversation is obviously a Platonic fiction in which Diotima seems to be a mantic witness to divine truth about Erôs. Perhaps this is Plato's dramatic means of preserving the Socratic claim to the sort of ignorance that drives dialectical inquiry.

by everyone to be a great god (*megas theos*). Diotima asks whether 'those who know' also accept this and Socrates asserts that absolutely everyone (*sumpanton*) agrees. Diotima rejects this assertion on the grounds that there are people who say that Erôs is not a god at all, for instance, herself and Socrates. She justifies this claim as follows (202c6 ff.): Socrates cannot deny that all gods are happy and beautiful (*eudaimonas kai kalous*), so it is those individuals who possess good and beautiful things who are called happy. But it has already been agreed (by Agathon and Socrates) that a lack (*endeia*) of good and beautiful things makes Erôs desire the very things he lacks. So he cannot be a god, if he has no portion (*amoiros*) of beautiful and good things. Thus Socrates' own view implies that Erôs is not a god.

But, on the other hand, this does not mean that Erôs is mortal (*thnêtos*) [36] as he may have an intermediate (*metaxu*) status, namely, that of a spirit (*daimonion*). The power (*dunamis*) of such a spirit is that of interpreting and conveying things from men to gods and from gods to men. Situated in the middle, Erôs bridges the gap between gods and men, so that the whole (*kosmos*) is bound closely together (202e6–7). It is in this way that the expertise of the seer (*mantikê*) works its effects, and that of priests, and all those concerned with sacrifices, rites, and spells. Since gods do not mingle with mankind, it is through such expertise that all intercourse (*homilia*) and conversation (*dialektos*) takes place between gods and men, and the person who is wise about such things is a spirit-like man (*daimonios anêr*). There are many spirits of this kind, and one of them is Erôs. In light of such an account, it would appear that Diotima herself is a suitable 'medium' for conveying to Socrates divine wisdom about Erôs.

In response to a question from Socrates about the origins of Erôs, Diotima now departs from her short answer format to tell a rather long story (*muthos*) about the genealogy of Erôs, which links him closely with Aphrodite. According to this myth, Erôs is the son of Poverty (*Penia*) who was impregnated by Resource (*Poros*) on the birthday of Aphrodite. That is why Erôs is the follower (*akolouthos*) and attendant (*therapôn*) of Aphrodite, and also because he is by nature (*phusei*) a lover (*erastês*) in relation to what is beautiful (*peri to kalon*). The implications of this genealogy for understanding the nature of Erôs are spelled out (203b5) as follows: since he is the son of Resource and Poverty, Erôs is always poor (*penes aei esti*) and very far from delicate (*hapalos*) and beautiful (*kalos*), as Agathon thinks. Instead, he is hard, dirty, barefoot, homeless, always sleeping on the ground, without blankets, stretching out under the sky in doorsteps and by the roadside. In effect, due to his mother's nature, he always has lack (*endeia*) as companion. On the other hand, the inheritance from his father (Resource) makes him a schemer (*epiboulos*)

after the beautiful and good, while he is also courageous (*andreios*), impetuous and intense, a clever hunter (*thereutes deinos*), always weaving new devices (*mêchanas*). Clearly, the similarity in description between Erôs and Socrates is deliberate and significant.[3]

Just like Socrates, Erôs is said to be both desirous of wisdom and resourceful (*porimos*) in looking for it, philosophising through all his life, a clever magician, sorcerer and sophist. What Erôs gets for himself is always slipping away from him, so that he is neither resourceless (*aporei*) at any moment, nor rich (*ploutei*) but is in the middle (*en mesoi*) between wisdom (*sophias*) and ignorance (*amathias*). On the one hand (204a), no god philosophises or desires to become wise (for gods are already wise), nor does anyone else who is wise philosophise (which implies a lack). But, on the other hand, neither does the completely ignorant person philosophise or desire to become wise as he is not aware of what he lacks so cannot desire it. Hence those who philosophise are neither the wise nor the ignorant but rather those in between (*metaxu*), where Erôs also belongs.[4] Wisdom (*Sophia*) is actually one of the most beautiful things, and Erôs is desire for what is beautiful (*peri to kalon*), so that Erôs is necessarily a philosopher, and as such stands between wisdom and ignorance. The cause of this intermediate status is his birth: he has a father who is wise and resourceful (*euporos*) and a mother who is not wise and is resourceless (*aporos*).

Before moving on, let me briefly outline the pedagogical implications of this description of the nature and genealogy of Erôs. Clearly Erôs involves an acute awareness of some lack, and this fits quite well with the aporetic
[37] character of Socratic inquiry. The puzzlement in the | interlocutor which is induced through question-and-answer should serve in the ideal case as a stimulant for further inquiry, if one has a genuinely philosophical nature. This may be one of the reasons why the description of Erôs that emerges from the genealogy also applies so well to Socrates. They are not conceited beauties like Agathon but rather bereft and hungry lovers who subsist somewhere in between plenty and poverty. It is no accident that this turns out to be the intermediate realm occupied by the genuine philosopher.

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[3] This similarity has been noticed by Renaissance scholars like Ficino, in his *Symposium* commentary (*oratio* 7), and by many modern scholars, including Osborne (1994: 93–101), who makes much of the similarity in descriptions.

[4] According to Kahn (1996: 265), Plato's *Lysis* gives us a brief glimpse of the erotic model for philosophy that is taken up by Diotima in the *Symposium*.

III. *The Process and Goal of Erotic* Paideia

Drawing Diotima back into the routine of short question-and-answer, Socrates now (204c6) asks about Erôs and human beings: Why is Erôs always of beautiful things? Diotima speaks of trying to teach (*didaxei*) Socrates about the function of Erôs in human life, which she does by questioning him. Why does the person who loves, love beautiful things? In order to possess them for himself. But what will that person get by possessing them? Socrates is stumped by that question, so Diotima reformulates it in terms of the good: If the person loves good things, why does he love them? The ultimate goal of having the good is to be happy (*eudaimôn*). Those who are happy are so by virtue of having good things, and one need not go on to ask a further question as to why the person wants to be happy. The answer itself seems to be complete, since this desire to possess good things is common to all human beings. In effect, the line of questioning ends with the acceptance of a general axiom.

With reference to the myth of Aristophanes, Diotima declares that love is neither of a half nor of a whole, unless it turns out to be good. In summary (206a11), she claims that love is of the permanent possession of what is good, and this is agreed by Socrates to be most true (*alêthestata*). Given that permanent nature, however, the next question posed by Diotima is about the product (*ergon*) of the activity of love. Socrates confesses himself unable to answer and claims that this is what he seeks to learn from Diotima. She informs him that the activity of love is giving birth in the beautiful in relation both to body and soul. Socrates expresses his puzzlement at this by complaining that only a seer could discern what she means. In her role as seer, Diotima undertakes to reveal the mystery by means of an explanatory account.

According to this account (206c), all human beings are pregnant both in body and in soul, and naturally want to give birth when they come to be of the right age. Yet they cannot give birth in the ugly but only in the beautiful. The intercourse (*sunousia*) of man and woman is a kind of giving birth, which is something divine (*theion*). Despite their mortality, living creatures share in this immortal (*athanaton*) dimension through pregnancy and procreation. The conclusion here (206e) represents a deliberate correction of the previous account of love: Erôs is not simply *of* the beautiful but rather it is of procreation and giving birth *in* the beautiful. The explanation given for this is that procreation is something everlasting (*aeigenes*) and immortal (*athanaton*), insofar as anything mortal can be. And, according to the previous agreement, it is immortality together with the good that

must be desired, if love is of the permanent possession of the good (207a1). From this argument it necessarily follows that love is of immortality. As if to underline the theme of *paideia*, Socrates repeats that Diotima taught (*edidaske*) him all these things when she talked about erotic matters. The clear implication is that erotic *paideia* itself involves the sort of student-teacher relationship where the one who knows is leading the one who desires to know.

In line with Diotima's dialogical manner of teaching, there follows another question (207a5): 'What do you think, Socrates, is the cause of this love and this desire?' He draws a parallel with the lower animals, which suffer terribly as a result of this desire to procreate. They are stricken with the effects of love, first for intercourse with each other, and then for nurturing their offspring,
[38] so that the weakest are prepared to fight the strongest to protect their | offspring, and are prepared to die for them, torturing themselves with hunger so as to rear them, and doing whatever is necessary. Even if we assume that humans do this as a result of calculation (*ek logismou*), it is hard to discover the cause of animals being affected so powerfully by Erôs. Socrates confesses his ignorance and Diotima chides him as follows: Do you think you will ever become an expert in erotics (*deinos ... ta erôtika*), if you don't think about these things? Socrates repeats that he has come to Diotima because he needs a teacher. He begs Diotima to tell him the cause (*aitia*) of this (suffering of animals) and of everything else to do with love. Once again, it is noteworthy how the young Socrates is placed in the suppliant position of a student who seeks enlightenment from Diotima about the origins and causes of Erôs. Presumably, that puts him in the same position as a lover (*erastês*) who is painfully aware of what he lacks.

Beginning from the agreed nature (*phusis*) of Erôs, Diotima applies (207c7) the point to animals as well as to human beings, i.e. so far as it can, mortal nature seeks to exist for ever and to be immortal (*athanatos*). But it can achieve this only through the process of coming-into-being (*genesis*) because it always (*aei*) leaves behind something else that is new in place of the old. This applies even to individual organisms, during the time in which a living creature is said to be alive and to be the same individual (*to auto*). Diotima maintains (207e) that the same is true of the soul, since its traits, habits, opinions, desires, pleasures, pains and fears never remain the same in any individual, but rather some are coming into existence, others are passing away. She explains that it is even stranger in the case of our pieces of knowledge (*epistêmai*); since not only are some of them coming into existence and others passing away, but each individual piece of knowledge is subject to the same process. For what we call 'rehearsing' (*meletan*) exists

because knowledge goes out of us; forgetting is the departure of knowledge, and going over something creates in us again a new memory in place of the one that is leaving us, and so preserves our knowledge in such a way as to make it seem the same. This notion of going over something repeatedly was dramatically highlighted at the beginning of the *Symposium*, as if to underline the mnemonic power of rehearsal for making Socrates immortal in the memory of his students and lovers. Perhaps that illustrates one of the functions of erotic *paideia* through question-and-answer, i.e. that we can stabilise our right opinions through continual inquiry which is driven by desire for the good.

In this way, then, everything mortal is preserved (*sôzetai*), not by always being absolutely the same (*to auto aei einai*) like the divine, but by virtue of the fact that what is departing and decaying with age leaves behind in us something new of the same sort that it was. It is by these means that the mortal partakes of immortality, both body and everything else; whereas what is immortal (*athanaton*) partakes of it in a different way. So Diotima advises Socrates not to be surprised that by nature (*phusei*) everything values what springs from itself: this eagerness (*spoudê*) and this love (Erôs) that every creature shares is for the sake of immortality. But Socrates (208b7) feigns surprise on hearing this, and asks the most wise Diotima if what she says is really true. Just like an accomplished sophist, Diotima assures him that he can be sure of it, and now applies the lesson to human beings, whose irrationality shows in their love of honour. For the sake of fame they are ready to run all risks, even more so than they are for the sake of their children, i.e. they will spend money, undergo any suffering, and even die for fame. For instance, Diotima suggests that it was for the sake of immortal memory of their courage that Alcestis died for Admetus, that Achilles died for Patroclus, and that Codrus died for the sake of his children's succession to the throne. From these examples, she now draws (208d7) the generalisation: it is for the sake of immortal virtue and this sort of glorious reputation that everyone does everything; and even more so in the case of better people because they are in love with immortality.

By way of applying this generalisation, Diotima says (208e) that those who [39]
are pregnant in their bodies turn their attention more towards women, and their love is directed in this way, securing immortality, as they imagine, for themselves for all time by having children (*dia paidogonias*). By comparison (209a), those who are pregnant in their souls conceive and bring to birth wisdom (*phronêsis*) and the rest of virtue of which all the poets are reputedly procreators. But by far the greatest and most beautiful kind of wisdom is the setting in order (*diakosmêsis*) of the affairs of the city and households, which

is called 'moderation' (*sôphrosunê*) and 'justice' (*dikaiosunê*).[5] When by divine gift someone is pregnant in soul with those things from youth onwards, and on coming to the right age desires to give birth and procreate, then he goes around looking for the beautiful object in which he might procreate, for he will never do so in what is ugly. So he welcomes beautiful bodies rather than ugly ones, because he is pregnant, and if he encounters a soul that is beautiful and noble and naturally well-endowed, he gives an even warmer welcome to the combination of beautiful body and soul. And towards this person he is immediately full of resource (*euporei*) when it comes to saying things about virtue (*logon peri aretês*), and what sort of thing the good man must be concerned with, and the activities such a man should involve himself in and he tries to educate him (*epicheirein paideuein*). The close connection between *paideia* and erotic interaction is very clear from the language used here, whether that refers to the conventions of pederastic love or to the Socratic delight in engaging young men in conversation.

Diotima claims (209c2) that it is by contact with what is beautiful and associating with it that he brings to birth and procreates the things with which he was for so long pregnant. And he joins with the other person in nurturing what has been born, with the result that such people enjoy a much greater partnership (*koinônian*) with each other than the sort people share through their children, and a firmer affection (*philian*) between them, insofar as their sharing involves 'children' of a more beautiful and immortal kind. She goes on to make the controversial claim that everyone would prefer children of this sort over human children. For example, Lycurgus left behind him the laws of Sparta, which have been the saviours of Sparta und indeed of the whole of Greece. In Athens Solon is also honoured for having generated laws and similarly many men are honoured among Greeks and Barbarians for having generated many conspicuously beautiful things, including virtue (*aretê*) of all kinds. The evidence for this is the fact that cults (*hiera*) have been established for them because of their having children of this sort, whereas none has ever yet been set up for anyone because of their having human children.

Let me sum up the tentative conclusions arising from this section. The dominant procedure of Diotima's lesson about Erôs is that of putting some leading questions to Socrates about the causes and goals of love. For instance, in response to the question as to why a person loves good things, it is concluded that happiness is the ultimate goal for all human action. On

[5] Ostensibly, since he desires political success, this is the sort of wisdom that Alcibiades seeks from Socrates in exchange for sexual favours.

the assumption that human love is creative, there arises the question about its product. At the physical level, of course, the product of sexual intercourse between male and female is a child, whereas *logoi* are the products of erotic desire at the psychic level. However, Erôs is not simply *of* the beautiful but involves procreation *in* the beautiful, while the ultimate goal of erotic desire is to achieve immortality. At the level of body, this goal can only be attained through the replacement of one generation by another. Similarly, at the psychic level, immortality is attainable only through the replacement of individual pieces of knowledge, which are preserved against forgetfulness by rehearsing them. From this | perspective, one might see how [40] the Socratic method of question-and-answer helps to stabilise knowledge in the soul.

IV. *Culmination of Erotic* Paideia *as Initiation into the Mysteries*

Diotima accepts (210a) that Socrates could be initiated into these (lower) kinds of erotica, but doubts whether he will reach those aspects of the higher mysteries (*telea kai epoptika*) for the sake of which she has taught him the lower as the proper approach. Still she promises to tell him the next part, sparing no effort, and urges him to try to follow (*hepesthai*). At this point she seems to abandon the dialogical exchange with Socrates in favour of a monological narrative. She emphasises (210a5) that the correct approach to the higher mysteries is as follows: the young person must turn to beautiful bodies (*kala sômata*) and, if his guide leads him correctly, he must fall in love with a single body and there procreate beautiful words (*logous kalous*). According to Christopher Rowe (1998: 192), this passage is talking about the correct way to go about the business of erotics, i.e. what our goal should be, or rather, what our goal really is, and how we should set about achieving it, both in life as a whole and in our erotic relationships. The central figure is that of the lover, the *paiderastês* (211b6) who is 'led' by someone else through various stages of understanding of beauty, each stage issuing in his 'procreating' *logoi* apparently within some beloved (person or thing?). We can make historical sense of these references in terms of the fact that initiation into the lesser (or small) Mysteries at Agrae (in the city) was a necessary qualification for initiation into the Greater Mysteries at Eleusis (outside the city). When applied here, the point of the reference is that Socrates will need to learn what has gone before in order to grasp what follows. As a revelation of the sacred objects, the *epopteia* represented the high point of the Eleusinian Mysteries. Within the context of Diotima's teaching, the final revelation

is the ultimate goal of the whole dialectical inquiry for the sake of which she has taught Socrates everything that has led up to the vision of Beauty Itself.

The stages in the famous 'ascent' passage can be read either logically as steps of increasing generalisation or epistemologically in terms of more universal objects, culminating in the most universal object, Beauty Itself. But the real interest of the passage for me is the pedagogical steps that are set out by analogy with stages of initiation into the Mysteries. The first step is to fall in love with a beautiful body, which induces in the lover the desire to produce beautiful offspring. The next step (210a8) is to realise for himself that one and the same kind of beauty is to be found in any body whatever. The next stage (210b6) is for him to consider beauty in souls as more valuable than beauty in the body. This leads to the production of beautiful words rather than beautiful offspring, which was characteristic of the first stage. It is clear that these words are intended to educate young men in virtue, especially with regard to the ordering of the polis. For instance, at 209a5 it was already said that the greatest and most beautiful kind of wisdom is the setting in order (*diakosmêsis*) of the affairs of the city and households, which is called 'moderation' (*sophrosunê*) and 'justice' (*dikaiosunê*). Just as in the case of natural childbirth, so also this kind of procreation in words requires a suitable partner who has the right kind of beauty. So the lover embraces a beloved who is beautiful in soul and body, and tries to educate him by means of the right words, which flow out of him like semen. After political activities, which are still more or less particular, there is a transition to different kinds of knowledge where one can observe the beauty of knowledge, so that one is no longer slavishly attached to the beauty belonging to particular things. According to Diotima's account, this generates many beautiful words and thoughts in the form of unstinting philosophical creativity.

[41] Diotima says (210e) that whoever is led by his teacher thus far in relation to love matters (*pros ta erôtika*) and contemplates (*theômenos*) the various beautiful things in order and in the correct way (*orthôs*) will now approach the final goal (*pros telos*) of matters of love, and will suddenly (*exaiphnês*) catch sight of a beauty that is amazing in its nature (210e4–5), i.e. that very beauty which was the goal of all his previous labours. Its distinguishing characteristics are as follows: (1) First it is a beauty that always exists (*aei on*) and that neither comes into being nor perishes, neither increases nor diminishes. (2) Second, it is not beautiful in one respect but ugly in another respect. When someone moves upwards, away from particular beautiful things, through the correct kind of boy-loving (*paiderastein*), and begins to catch sight of that beauty (*ekeino to kalon*), he would practically have the final goal within his reach. For this is what is involved in approaching love

matters (*ta erôtika*) or to be led by someone else to them (*hup' allou agesthai*) in the correct way (*orthôs*), i.e. beginning from these beautiful things here, one must always move upwards for the sake of beauty itself, using the other things as steps, from one to two, and from two to all beautiful bodies; from beautiful bodies to beautiful activities, from activities to beautiful sciences and finally from sciences to that science which is the science of nothing other than beauty itself (211d: *autou ekeinou tou kalou mathêma*), in order that one may finally know what beauty itself is (*ho esti kalon*).

By way of summary for this section, allow me to review briefly the implications for erotic *paideia* of this elaborate parallel with initiation into the traditional Mysteries of Eleusis. This talk of being led by a teacher into the higher Mysteries implies that the leader is already initiated, so that Diotima is a philosopher who is leading Socrates to enlightenment about Erôs through the ascent to Beauty or the Good. The stages of that ascent are set out very schematically yet the method of leading remains unclear, since Diotima merely urges Socrates to follow her as best he can. The first step seems to be based on the natural desire to procreate in a beautiful body, but the basis for the second step is less obvious. Presumably, the lover is led to realise that the same beauty is to be found in all beautiful bodies through Socratic questioning that leads to generalisation. Through increasing generalisation, the lover ascends to the level of practical wisdom which is concerned with political affairs, dealing with virtues like moderation and justice. Even higher generalisations are involved in the theoretical wisdom of the many different sciences like mathematics, which possess their own kind of beauty. However, the desire for eternal beauty reflected in the sciences draws the lover further beyond that level towards the Good and the Beautiful, which transcend all human goods. But no details are given of the educational procedure by which that goal is finally reached, although the explicit parallel with the Mysteries suggests that the final illumination is gained by the initiate only after quite elaborate preparation in the hands of an experienced guide.

V. *Alcibiades as a Failure in Erotic* Paideia

The appearance of Alcibiades in a drunken state, accompanied by a flute girl and his head wreathed with ivy and violets, is symbolic of the god Dionysus giving the award first to a poet then to a philosopher. Alcibiades declares (212e4) that he has come to crown from his own head the wisest (*sophotatou*) and most beautiful (*kallistou*) head. He takes back (213e), some ribbons from Agathon in order to crown Socrates' amazing head, while explaining that

Socrates uses words to defeat everyone. It is clear both that Alcibiades sees the Socratic dialectic as being agonistic in character, and that he implicitly espouses the Homeric motto: 'Always to excel (the others)'. Despite being the darling of the Athenian mob, he has been rejected by one of the ugliest men in Athens who has forced him to give up this role as a beloved and become
[42] instead a needy lover. This was a great shock to his | pride, jolting him out of the sort of complacency that typifies Agathon; with the result that Alcibiades learned to see the beautiful *logoi* that are hidden within the ugly body of Socrates.

This is why he compares Socrates to one of the Silenus figures found in statuary-shops, which are made by craftsmen complete with pipes and *auloi*. When you open them up by taking them apart, they turn out to have statues of gods inside them. Alcibiades also declares Socrates to be like the satyr Marsyas. He challenges Socrates to deny that he is Silenus-like in physical appearance (*eidos*), and he promises to show how Socrates is like these satyrs in everything else. Alcibiades insists (215c5) that Socrates differs from Marsyas only in doing the same thing without instruments and through simple (artless) words. Alcibiades testifies on oath (215d6–7) about the sort of effect which he has felt under the spell of Socrates. He says (215e1) that it is similar to the state of the Corybantes, only much worse, i.e. heart leaping, tears pouring out under the impact of Socrates's words. As a result, Alcibiades reports that he frequently considered that life was not worth living, given his present condition (of slavery to desire), but yet he fails to change his life.

Alcibiades admits that if he were ready to listen to Socrates he would be unable to resist because Socrates forces (*anankazei*) him to see that, although there is much that he himself lacks, yet he neglects himself and instead takes care of the business of the Athenians. So Alcibiades forcibly stops his ears and bolts, as if running away from the Sirens, to prevent himself from sitting and listening to Socrates. Alcibiades now (216a–b) confesses that Socrates is the only person in the world before whom he has experienced shame (*to aischunesthai*). Why? For he is conscious of being incapable of arguing against doing what Socrates tells him to do, yet he yields to his desire for honour (*timê*) bestowed by ordinary people. Thus he bolts from Socrates like a runaway slave and when he sees Socrates again he is ashamed of what was already agreed in previous discussions. In effect, he fails to make progress under the tutelage of Socrates.[6]

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[6] Lear (1998, ch. 7) claims that this failure reflects badly on Erôs as a means for getting human lovers to transcend the particular objects of their desire, and that this is Plato's intention

Alcibiades promises (216d1) to reveal the real character of Socrates concealed by his feigning of being in love with beautiful young men and of being ignorant of everything. All of these appearances are his external (*exôthen*) covering, like that of the sculpted Silenus; whereas inside (*endothen*), when he is opened up, Socrates is full of moderation (*sôphrosunê*). Alcibiades assures them that Socrates doesn't care at all whether someone is (physically) beautiful nor does he care if someone is rich or has any of the things that gives a man honour in the eyes of ordinary people and makes them call him blessed. Socrates thinks that all these possessions are worthless and that we are nothing; so that he is continually pretending and playing with people. But when Socrates is in earnest, and so is opened up, Alcibiades claims that he has seen the statues (*agalmata*) inside and that they appeared to him so divine (*theia*) and golden (*chrusa*), and so outstandingly beautiful (*pankala*) and amazing (*thaumasta*) that he had to do whatever Socrates told him.

But Alcibiades' account of his attempted seduction of Socrates belies the claim to have understood the inner nature of Socrates. Thinking that Socrates was seriously attracted by his youthful looks, Alcibiades considered it amazingly fortunate that he could hear from Socrates everything he knew in return for (sexual) favours. Alcibiades emphasises how proud he was of his own physical appearance. In order to snare him as a lover, Alcibiades arranged to be alone with Socrates in the hope that he would make overtures to him as a lover (*erastês*) would to a young beloved (*paidika*). But Alcibiades was surprised to discover that nothing | like that happened, as Socrates [43] conducted his habitual kind of conversation with Alcibiades and then left after spending the day with him. Next (217c) Alcibiades invited Socrates to exercise with him (naked in the gymnasium), thinking that he would get somewhere through physical contact. But Socrates did exercise and wrestle with Alcibiades without becoming sexually excited in any way. After exhausting these indirect strategies, Alcibiades decided to try a direct assault on Socrates, since he had started the whole seduction and he did not want to face rejection.

So Alcibiades invited Socrates to dine with him, like a lover (*erastês*) plotting to have his way with his beloved. Knowing well the game that was afoot, Socrates was slow to accept this invitation but eventually did so, only to leave immediately after dinner. On this occasion, Alcibiades

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in drawing attention to the fixation of Alcibiades on his earthly loves. I do not find this consistent with Plato's use of erotic language to characterise the whole ascent to the vision of Beauty Itself.

was too ashamed to detain Socrates, but on the next occasion he kept the conversation going late into the night, so as to force Socrates to stay. This new strategy of seducing Socrates through conversation seems to suggest that only rational persuasion could 'force' him to stay.

However, Alcibiades tells of how he made a direct attempt to seduce Socrates by offering sexual favours in return for knowledge. He continues to treat Socrates as a prospective lover (*erastês*), though the roles have been silently reversed. His proposal to Socrates is cloaked in the conventional language surrounding pederasty in ancient Athens. Alcibiades expresses a desire to become as good a person as possible and considers Socrates the most effective collaborator for this purpose. Socrates is described (218d–e) as having listened in his usual fashion with great pretence of seriousness (*eirônikôs*) before replying that Alcibiades is trying to cheat him by getting hold of truly beautiful things in return for only apparently beautiful ones, just like a swindle in some commercial exchange.

The subsequent (219a) ironic warning reflects the typical pose of Socratic ignorance: 'You need to take a better look, my fine friend, in case you are mistaken about me and I'm really nothing. The sight of the mind (*dianoias opsis*) begins to see sharply (*oxu blepein*) when the sight of the eyes starts to fade from its prime, and you are still far away from that.' This reply encapsulates the essence of the whole ascent to intelligible beauty, and also the failure of Alcibiades to make that ascent. Alcibiades does not quite understand (219a6) the ironic intention of Socrates and restates his own case (i.e. that he is ready to gratify Socrates in exchange for wisdom), asking Socrates to consider what is best for both. Socrates agrees to deliberate together on how to act in the best way for both of them in the present situation and all others. But Alcibiades is still fixated on his desire for conquest, and he interprets Socrates' agreement as evidence that his arrows have struck home. So he wraps his cloak around both of them on the same couch, and for the whole night he embraces that truly superhuman and amazing man. Having made his best move in vain, Alcibiades complains that Socrates got the better of him, looked down on him, laughed at his beauty and treated it criminally (*hubrisen*). Using the language of the law courts and addressing his audience as jurors (*dikastai*), Alcibiades accuses Socrates of hubris for despising his physical beauty.

Alcibiades admits (219d) that he had no success in seducing Socrates and describes his own ambiguous state of mind. On the one hand, he had been humiliated but, on the other hand he admired Socrates for his self-control (*sôphrosunê*) and his courage (*andreia*) because he never expected to meet a person with that sort of wisdom (*phronêsis*) and endurance (*karteria*). As a

result, Alcibiades couldn't be angry and deprive himself of Socrates' company (*sunousia*), yet he had no idea how to win him over. He couldn't bribe him with money, nor could he seduce him by using his own physical beauty; so he was completely at a loss (*êporoun*) and went around in a state of enslavement (*katadedoulômenos*) to this unique individual.

By way of testimony to the strangeness of Socrates, Alcibiades now tells of [44] his experience on the expedition to Potidaea, when (like lovers) they shared the same mess. He offers several pieces of evidence for the extraordinary character of Socrates: (1) He endured hardships (*karterein tois ponois*) better than everyone else, e.g. when they were without food or cut off. (2) When it came to feasting, he was the only one able to take proper advantage, especially when forced to partake in drinking he outlasted everyone else, and most amazingly no one has ever seen Socrates drunk. (3) With regards to feats of endurance (*kartereseis*) in the cold of winter, Socrates did amazing (*thaumasia*) things, e.g. in a terrible frost when everyone wore warm clothing and footwear, he went around barefoot, wearing a light cloak. The other soldiers looked askance at him, as though he were despising them. (4) Alcibiades tells of how Socrates stood all day and night wrestling with some intellectual puzzle (as in the *Symposium* itself), yet he wouldn't give it up and stood there inquiring. The soldiers (especially the Ionians) wondered at this intellectual feat of concentration, which could only be externally observed as physical endurance in standing stock still for so long.

As if to confirm the traditional military function of pederastic love, Alcibiades gives evidence of Socrates' bravery in battle because it is only right (*dikaion*) to pay tribute to him for this. On the occasion of a battle in which the generals gave a prize to Alcibiades for being the best (*t'aristeia*), he acknowledges that Socrates saved his life because he wouldn't desert him when he had been wounded but rather managed to bring both himself and his weapons (a point of military honour) to safety. On another occasion Socrates displayed bravery on the retreat from Delium, when Alcibiades happened to be a cavalryman while Socrates was a hoplite. The army was breaking ranks into a rout, and Socrates was withdrawing along with Laches, when Alcibiades came along on his horse and shouted encouragement, promising not to desert them. This could be seen as repayment of an earlier debt to Socrates or as the undying loyalty of lovers. In describing his demeanour, Alcibiades uses the same words as Aristophanes about how Socrates behaved in Athens: 'swaggering and casting his eyes this way and that', i.e. observing (*paraskopon*) people, both friends and enemies, in the same calm way, and making it plain to everyone far and near that they would meet stiff resistance if they laid a hand on him.

Alcibiades claims (221c) that there are many other amazing things (*thaumasia*) to be said in praise of Socrates yet the most amazing thing is that there is no one like Socrates among present or past generations. While Achilles could be compared to Brasidas, and Pericles to Nestor and Antenor, Socrates is so strange (*atopia*) both in himself and the things he says that one could never find anyone like him if one looked among past and present generations, unless one compared him to silenuses and satyrs. This comparison is now (221d–e) elaborated further: Socrates' words (*logoi*) are like the silenuses that open up. If one were willing to listen to what Socrates says, it might appear absurd at first because of the terms in which it is clothed, like some mischievous skin of a satyr, e.g. he talks of pack-asses, blacksmiths, cobblers and tanners. He always appears to be saying the same things in the same ways, so that an inexperienced (*apeiros*) and silly (*anôetos*) person might laugh at what he says. But (222a) if one were to see these words opened up, and one were to get inside (through Socratic dialogue) then one would first discover that they are the only words with any intelligence (*nous*) within them; and then that they are divine to the highest degree and contain within them the greatest number of statues of virtue (*agalmata aretês*) and have the greatest extension, i.e. they extend to everything that is appropriate for the man who means to be a person of quality (*kaloi kagathoi*) to consider. We should notice that Plato here transforms the conventional ideal of a gentleman into that of a truly noble person.

[45] Alcibiades then (222a–b) concludes his praise of Socrates while reminding his audience of the crimes (*hubrisen*) that Socrates has allegedly committed against him. He adds that Socrates has committed hubris against other young noblemen like Charmides and Euthydemus by being deceptive in playing the conventional role of lover (*hôs erastês*), while becoming more of a beloved (*paidika*) himself rather than a lover. This claim emphasises the shift in roles within the *Symposium* from that of beloved to that of lover, which is a necessary part of the initial ascent towards Beauty Itself. Thus Alcibiades warns Agathon not to be deceived by Socrates but to learn from the sufferings of others, so as not to have to learn like a fool from his own suffering.

Conclusion

With the exception of two short interludes, the so-called speech of Diotima about Erôs is dominated by question-and-answer exchanges between herself and Socrates, which continue the dialogical exchange between Socrates and Agathon. I have drawn attention to this fact because I think it is a significant

feature of erotic *paideia* that questioning makes the student aware of a lack of knowledge and thereby stimulates a desire for what is lacking. This provides a neat parallel with the character of Erôs as a desire for the Beautiful and the Good, which prompts the lover to generate beautiful things, whether these should be children in a beautiful body or *logoi* as offspring of a beautiful soul. The ultimate purpose of erotic *paideia*, however, is to lead the lover to a vision of Beauty or the Good itself, which transcends all particular beauties of body and soul. The steps of such an ascent are outlined schematically by Diotima, who suggests that Socrates will be ready for initiation into the higher Mysteries through her previous lessons about Erôs which took the form of question-and-answer. By contrast, we can see that Agathon has failed to make any progress, even after he has been refuted, presumably because his vanity as a beloved object prevents him from adopting the role of a lover who becomes aware of a lack in himself and thereby is driven to inquire. By comparison with Agathon, however, Alcibiades does progress from the role of beloved (despite his vanity about his beauty) to that of a lover, when he is faced with the mystery of Socrates whose physical ugliness hides the beautiful *logoi* within. This discovery of the spiritual beauty of Socrates is already a great achievement for Alcibiades, given the ancient Greek aversion to physical ugliness, but yet he fails to progress further up the ladder of beauty. What is the significance of Alcibiades' failure to make that ascent to Beauty Itself? Does it simply reflect a flaw in his character or does it indicate some basic flaw in human *erôs* as a means for this ascent, as Jonathan Lear (1998) has suggested? My claim is that his failure reveals a character flaw (like the gifted young men in the *Republic* who go badly wrong) and is not to be attributed to some basic deficiency in erotic *paideia*, which can lead someone to Beauty or the Good if one is willing and able to be led properly by a philosophical guide.

CULTIVATING INTELLECTUAL VIRTUE IN PLATO'S PHILOSOPHER-RULERS

Introduction

For many complex historical reasons, the educational context in Plato's *Republic* is merely acknowledged in a perfunctory fashion by modern scholars before they proceed to the epistemological and ontological issues that interest them in the dialogue.[1] By contrast, I want to place education at the very centre of my reading of Plato's *Republic* because I am convinced that the problem of *paideia* was central to Plato's political problematic. This is particularly the case, I argue, in relation to Books 6 & 7 where Plato addresses the question of how to educate the philosopher-rulers who are to guide the notional city of Kallipolis. In this paper, therefore, I will discuss the intellectual virtues to be cultivated through mathematics and dialectic in the educational curriculum, which is prescribed for the philosopher-rulers. There is a prima facie problem about the need for such a curriculum to develop the intellectual virtues because Plato seems to regard them as having been given by nature. By contrast with the ethical virtues which can be developed by habit and practice, the intellectual virtue of *phronêsis*, for instance, is said to be divine and never to lose its potency; so that it can only be useful or harmful, depending on its orientation (*Rep*. VII 518d–e). Yet, subsequently, an elaborate scheme of education is outlined for turning the natural capacity of human intelligence away from the sensible world and towards the intelligible realm. But, perhaps due to the historical influence of Plato, we would now describe this reorientation in terms of the cultivation of intellectual virtue. Thus I will consider how Plato understands mathematics and dialectic to be promoting intellectual virtue, which he often described in terms of *phronêsis*.

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[1] A noteworthy exception is W. Jaeger (1945) who places the topic of *paideia* at the head of his list when interpreting Plato's *Republic*. Another notable exception is H.-G. Gadamer (1986a), from whom I have learned most, though I differ from him on some points of detail in my interpretation of the *Republic*.

I. *Distinction between Philosophers and Philodoxers*

We find some anticipations of Plato's higher educational programme in Book 5 with its emphasis on selecting the proper natures for guardianship by
[80] means of | eugenics and selective mating through rigged lots. For instance, the argument in favour of equal treatment for women (*Rep*. 454d ff.) depends on them having the same natural capacity as men for guarding and ruling. But the main point of anticipation arises when the question about how such an ideal *polis* can come into existence is answered at 471c in terms of the nurture and education of philosopher-rulers. Anticipating stiff resistance, Socrates emphasises (472b–c) that he is talking about ideal types, such as the perfectly just man, who may not exist but who is still worthy of imitation. In effect, he claims (472e) to be setting up in words the pattern of a good *polis*, which remains a legitimate standard, even if never realised anywhere. Socrates asks (473a) his interlocutor to accept the nearest thing to an ideal *polis*, and then to consider the conditions for its possible realisation. The guiding questions for this line of inquiry are as follows (473b): What is badly managed in existing cities, so that it prevents them from being well governed? What is the smallest change that would bring the *polis* to a better manner of government? His answer (473d) constitutes the greatest paradox, namely, that philosophers should become rulers or that existing rulers should become philosophers. In effect, he proposes an unusual conjunction of political power (*dunamis politikê*) and philosophical intelligence (*philosophia*), given that these are usually found in separate domains.

Faced with the threat of public ridicule, Socrates first undertakes (474b) to clarify the identity of the genuine philosophers who ought to be rulers. He proposes the elitist principle that some people are suited by nature to study philosophy and to rule, whereas others should leave philosophy alone and be ruled. Referring to the erotic element in all human activity, Socrates introduces (474c) the axiom that when one is a lover of something, one is obviously a lover of all of it. As applied to philosophy (475b–c), this means that when someone is a lover of wisdom, he desires all of it and not merely a part. Glaucon objects (475d) to such a definition on the grounds that it would also cover the lovers of sights and sounds, who cannot get enough of spectacle, though they are unwilling to listen to a serious debate. Socrates admits (475e) that they bear a certain likeness to philosophers but yet claims that they are not to be counted as genuine philosophers, who are in love with truth. Subsequently (476a ff.), he clarifies the point by means of the distinction between lovers of spectacle and those rightly called philosophers. The crucial point (476b–c) is that lovers of sights and sounds delight in beautiful tones,

colours, and shapes but not in the nature of the beautiful itself. In effect, they are incapable of abstract reasoning about the Form, by contrast with the few who can contemplate Beauty Itself. Socrates insists that these few are the real lovers of truth who experience a genuine desire for union with the object of their desire.

Consequently, it is agreed (478a) that opinion is distinct from scientific knowledge, as each of them is related to a different object, i.e. science involves knowing that which really exists. According to the definition of faculties (given at 477c), they have distinct objects so that it is necessary to seek a different object for opinion. | But opinion cannot be about nothing, as that [81] is the object of ignorance. Socrates rules out (478c–d) the possibility that opinion is a faculty that exceeds either knowledge in lucidity or ignorance in obscurity. So, by a process of elimination, it must be a faculty between (*metaxu*) the two, so that its appropriate object also lies between that which is and that which is not. Thus the task (478e) is to discover whether anything partakes both of being and of not-being, so that it can be rightly called the object of opinion (*doxaston*). Socrates envisages (478e) questioning those lovers of sounds and spectacle, who believe in many beautiful things, though not in the idea of beauty itself. The crucial question is whether any of these beautiful things will not sometimes appear ugly, and the answer is that it is inevitable that things will appear both beautiful in one way and ugly in another. Each of these (sensible) things will always partake of both (contraries). Such things belong in the intermediate (*metaxu*) region between being and non-being, and so they are the characteristic objects of opinion (*doxaston*) rather than of knowledge (*gnoston*). Thus (the argument concludes) lovers of sights and sounds are lovers of opinion (*philodoxoi*) rather than being philosophers.

II. *The Natural Mental Capacities Required for Philosophy*

Book VI (484a) begins with a review of the argument that will reveal who the genuine philosophers or lovers of wisdom are, as distinct from those who are not. In response to Glaucon's request for guidance, Socrates claims (484b) that the next issue is to decide which of the two kinds of people ought to be leaders in the *polis*; either the philosophers, who are capable of grasping that which is eternal and unchanging, or those lovers of sights and sounds who lose themselves amid the flux of things. The decision depends on which kind of people seem competent to guard the laws and activities of the *polis*, since these people should be installed as guardians.

With reference to the requisite character of these guardians, Socrates asks (484c) whether they should be blind or keen of sight. The blind are compared to those who are really deprived of the knowledge (*gnôsis*) of the true being of things, i.e. those who have no vivid pattern in their soul, and so cannot contemplate the truth. Rather than choose blind souls, Socrates argues that they should select those who have learned to know each being, and who are neither lacking in experience nor inferior in any part of virtue. Clearly, the cultivation of ethical virtue in the guardians is being treated by Plato as a precondition for developing their intellectual virtue.

The next explicit (485a) task is to say how it is possible for the same persons to have both ethical and intellectual virtues. Socrates insists that it is necessary to understand the nature they must have from birth, so as to agree on the combination of qualities being sought in the guardians of the *polis*. Thus he recalls (485b) the first characteristic of a philosophical
[82] nature, namely, that it is in love with the kind | of knowledge which reveals something of the eternal essence, and which is not wandering between the two poles of generation and decay (*Crat*. 411c, *Phd* 95e). The second agreed characteristic of such a nature is that its desire should be for the whole of this knowledge and that it does not voluntarily give up any part of it. That was the point of the previous axiom (*Rep*. V 474c–d) concerning lovers and men covetous of honour.

The third characteristic is described as a spirit of truthfulness, or reluctance to admit falsehood in any form. Socrates insists (*Rep*. VI 485c) that nothing can be found more akin to wisdom than truth (*Leg*. V 730c; IX 861d; *Crat*. 428d, 382a). Here Plato applies a strong version of the truthfulness condition, i.e. that it is impossible for one and the same nature to be a lover of wisdom (*philosophon*) and of falsehood (*philopseudê*). Thus the true lover of knowledge (*philomathês*) must always be desirous of truth in all its forms. By way of explanation, Socrates claims (*Rep*. VI 485d) that when desires (*epithumiai*) incline strongly to any one thing, they are weakened for other things; just like a stream that is diverted into another channel. So, when a man's desires have been taught to flow through the channel of learning, he will be concerned with the pleasures of the soul in itself, and if he is to be a true rather than a sham philosopher he will become indifferent to those desires or pleasures of which the body is an instrument. In effect, Socrates holds (IX 585e) that such a genuine philosophical nature will be temperate (*sôphrôn*) and by no means greedy for wealth or for the things that money can buy.

An important criterion used (VI 486a) for distinguishing the philosophical from the unphilosophical nature is any sign of illiberality (*aneleutheria*),

though *eleutheria* is not confined to matters of money (*Theaet*. 144d: χρημάτων ἐλευθεριότητα), since it is a general characteristic of the soul of a gentleman. Here Plato seems to be referring to the mental capacity for taking a universal view of things, which transcends the particular fixations of a pettifogging specialist. This is partly confirmed by what Socrates says about a mind habituated to thoughts of grandeur (*megaloprepeia*) and to the contemplation (*theôria*) of all time and all existence, namely, that it can hardly regard the life of man as a matter of great concern.[2] By contrast, a cowardly and illiberal nature cannot partake in genuine philosophy. Consequently, Socrates claims, a man of orderly spirit (*kosmios*) who is not a lover of money (*philochrêmatos*), nor illiberal (*aneleutheros*), nor a braggard (*alazôn*), nor a coward (*deilos*), nor unjust (*adikos*), is someone who has the sort of nature suitable for philosophy. In our modern terms, these could be classified as moral qualities which function as preconditions for the development of intellectual virtue.

A related moral criterion (*Rep*. VI 486b) for distinguishing the philosophic from the unphilosophic soul is whether the man from youth onwards has been just and gentle or unsocial and savage. But perhaps a more important (intellectual) | criterion (486c) is whether he is quick (*eumathês*) or slow to [83] learn (*dusmathês*). Appealing once again to the erotic drive behind all human inquiry, Socrates explains that no one could possibly love a task which he performed painfully and with little return from much toil. And if he could not retain what he learned, he could not fail to be lacking in knowledge. Thus, having all his labour in vain, he will finally be forced to hate himself, as well as that activity (*praxin*). Thus Socrates concludes (486d) that it is not the forgetful soul that belongs among the lovers of wisdom, but rather the soul with a good memory.

The general point is that in human nature lack of culture leads to lack of measure or proportion (*ametrian*), while truth is more akin to measure and proportion (*emmetria*) rather than to disproportion. Socrates says (486d–e) that we must search for a mind (*dianoia*) endowed by nature (*phusei*) with measure and grace (ἔμμετρον καὶ εὔχαριν), whose native disposition (*autophuês*) will render it easily guided towards the ideality of each thing. Finally, Socrates gives a summary review (486e–487a) of the qualities that are necessary and mutually compatible in a soul that is to grasp reality completely, namely, good memory, quickness in learning, magnificence, grace (*eucharis*), friendliness to truth, justice, bravery, and sobriety. Assuming that

[2] *Theaet*. 174e: εἰς ἁπᾶσαν εἰωθὼς τὴν γὴν βλέπειν. See Aristotle, *EN* IV, 2, 1123b32 for a description of the great-souled man.

the Forms are universals of some sort, Plato seems to be referring here to a natural capacity of the human mind for generalisation in its search for the intelligible 'look' (*eidos*) of things rather than their changing appearances.

III. *Cultivating the Intellectual Capacity for Generalisation*

By way of preamble to his own proposals for cultivating intellectual virtue, Socrates later (498a) offers a brief criticism of contemporary modes of education. At present those who pursue philosophy do so as youths (*meirakia*), who approach the most difficult part of philosophy and then drop it before they proceed to business and money-making. These mere boys are (absurdly) regarded as the best exhibits for philosophy. In later life, these 'philosophers' think they have achieved a great deal if, when invited, they deign to listen to a philosophic discussion by others, since they regard that sort of thing as superfluous (*parergon*). When he refers here to 'the most difficult part of philosophy', Socrates seems to have in mind the sort of discussion that requires a dialectical capacity for question-and-answer.

For the development of such a capacity, however, Socrates lays out (498b) a very different order of studies from the conventional *paideia*. While they are youths, the boys should occupy themselves with an education (*paideia*) and culture (*philosophia*) suitable to youth; and while their bodies are growing to manhood, they should take good care of them, thus securing a support for the intellectual life (*philosophia*). But, with the advance of age, when the soul begins to attain its maturity, they should make its exercises more severe. And when their bodily strength declines and they are past the age of political and
[84] military service, then they should | do nothing but philosophise, if they are to live happily and die content with their appropriate destiny in that other world.

So far Socrates has provided only the barest outline of an alternative scheme of education that is to be filled out in these two books of the *Republic*. In a dramatic interlude, Adeimantus remarks (498c–d) on the earnestness of Socrates' new proposals for educating the youth, but anticipates stubborn opposition among the audience who will not be convinced. Socrates promises (498d) to spare no effort until he convinces Thrasymachus and the rest of the audience, or else achieves something (i.e. philosophy) that will profit them in another life. This dramatic interlude could be Plato's way of hinting that these interlocutors of Socrates may prove incapable of engaging in true dialectical discussion, despite his best efforts. Socrates also explains the

unwillingness of the multitude to believe what he says, given that they have never seen a man 'equilibrated' and 'assimilated' to virtue itself, either in word or deed (ἔργῳ τε καὶ λόγῳ), while ruling in a city that has similar virtue. The multitude has never been seriously inclined to listen to noble (*kalon*) and liberal (*eleutheron*) discussion, whose sole purpose is to seek out the truth (τὸ ἀληθές) at any cost for the sake of knowledge. Such discussions are very far removed from all the subtleties and cavils that lead to nothing but opinion (*doxa*) and strife (*eris*) in the lawcourts and in private gatherings. Once again, we should notice the contrast which Plato draws between the theoretical orientation of philosophers towards truth, and the pragmatic orientation of 'useful' disciplines like rhetoric and antilogic. This is a variation on his standard distinction between *phronêsis* and *technê*, which underpins the difference between moral virtue and mere cleverness.

At 500b–c we find a preliminary description of the intellectual conversion of the genuine philosopher to divine things. By contrast with those who are disputing about petty human affairs, the man whose mind (*dianoia*) is truly fixed on eternal realities (πρὸς τοῖς οὖσι) has no leisure to turn his eyes downward upon the petty affairs of men, such that he would engage in strife with them. Instead, he fixes his gaze upon things belonging to the eternal and unchanging order (κατὰ ταὐτὰ ἀεὶ ἔχοντα), where things are not involved in strife but all remain in rational harmony with each other. Thus he will try to imitate them (*mimeisthai*) and, so far as possible, to fashion himself in their likeness and assimilate himself (*aphomoiousthai*) to them.[3] For it is impossible to avoid imitating the things to which one attaches oneself with admiration. As a result, the lover of wisdom, associating with the divine order, will himself become orderly (*kosmios*) and divine (*theios*), insofar as this is possible.

Socrates next (502c–d) addresses the task which remains, namely, to describe the mode and the content of the studies (*mathêmata*) that are necessary to produce or educate those preservers of the constitution, and at what ages they should undertake | each study. Subsequently, he reviews [85] (503a) the tests for the best guardians: they must show themselves lovers of the city, when tested in pleasures and pains, and thereby show that they will not abandon this fixed faith under the duress of labours or fears. Anyone who cannot keep faith must be rejected, while whoever emerges from the test pure and intact, like gold tested in fire, is to be set up as ruler and is to receive honours in life and after death. Socrates now summons up

[3] See *Theaet*. 176e for the Platonic ideal of ὁμοίωσις θεῷ.

his courage for the paradoxical pronouncement, namely, that philosophers must be established as the most perfect guardians. He asks his interlocutor, Adeimantus, to notice that such people will probably be few because the different aspects of the nature (*phusis*) presupposed by their education rarely 'grow' together (*symphuesthai*) and these qualities are usually found separately. Once again, he reviews (503c) the list of such qualities, namely, facility in learning, good memory, quickness of wit, sharpness of mind, and all that goes with it, including youthful spirit and magnificence of soul. In human nature these qualities are rarely combined with a disposition to live orderly, quiet and stable lives. Instead, due to their quickness, these men tend to be playthings of chance and to lack steadfastness.

On the other hand, Socrates concedes (503c–d) that the steadfast (*bebaia*) and stable temperaments (*êthê*), who in war are not easily moved (*duskinêta*) and aroused to fear, are immobilised when confronted with studies. They are not easily aroused (*duskinêtos*), learn with difficulty (*dusmathôs*), as if benumbed, and are filled with sleep and yawning when an intellectual task is set them. Therefore, there are drawbacks to both extremes of temperament, but it is necessary for the good student to partake (*metechein*) of both temperaments in the right combination, otherwise he cannot participate in the highest education, or in ruling. But Socrates notes (503e) that such a blend of temperaments will be rare. Just as the best guardians are tested through toils, fears, and pleasures, so also the potential rulers will be exercised (*gumnazein*) in many studies, while being observed to see whether their nature is capable of enduring the greatest studies (τὰ μέγιστα μαθήματα) or whether it will faint or flinch, as men flinch in the trials and contests of the body.

This naturally leads on (504a) to the question as to what these greatest studies are, and Socrates recalls the previous (IV 435a–436b) distinctions between three kinds of soul, and the definitions of virtues like justice, sobriety, bravery and wisdom (*sophia*). He also recalls that for the most perfect discernment (*katidein*) another longer way was necessary to make them obvious to the traveller on this route, but still he admits that it was possible to add proofs (*apodeixeis*) on a par with the preceding discussion. Socrates reminds Adeimantus that he had accepted such 'proofs' as sufficient and, on the basis of this agreement, they had proceeded with a discussion that fell short of ultimate precision. Adeimantus agrees that the level of discussion is appropriate for himself and the company. I think we can find here a clear hint from Plato that the discussion is being conducted at a lower level to suit the abilities of the interlocutors—perhaps even at the level of mathematical *dianoia*, given its reliance on images.

However, Socrates expresses (VI 504c) dissatisfaction with any measure [86]
(*metron*) of such things that falls short of reality (τοῦ ὄντος) because nothing that is imperfect can be the measure of anything, even if some people think they have done enough and there is no need of further inquiry. Socrates claims that many people suffer this reluctance for inquiry as a result of sloth, which is least of all suitable for a guardian of the city and its laws. Such an aspiring guardian must travel the longer way and must labour no less in studies than in physical exercises, otherwise he will never reach the goal of the greatest study which most properly belongs to him.

At this point, Adeimantus wonders (504d) whether there can be any studies greater than those about justice and the other demotic virtues. In reply, Socrates emphasises that not only are there greater objects of inquiry but that the previous outline given for the demotic virtues will no longer suffice. It would be absurd, he claims, to strive for the utmost precision (*akribestata*) and clarity (*katharôtata*) about trifling matters, yet not demand the greatest precision about the greatest matters. Once again, Adeimantus is provoked (504e) to ask the question about what is the greatest study and what is its subject matter. Socrates declares (505a) that he (Adeimantus) has often heard that the greatest thing to learn (*megiston mathêma*) is the Idea of the Good (ἡ τοῦ ἀγαθοῦ ἰδέα) by reference to which just things (*dikaia*) and all the rest become useful and beneficial (χρήσιμα καὶ ὠφέλιμα). This is what Socrates proposes to speak about, adding that we have no adequate knowledge of it. Yet, without such knowledge, all other knowledge is useless to us, just as no possession is of any use to us without the good.

The problem, however, is that there are competing views of the good, i.e. the mob takes pleasure (*hêdonê*) to be the good, while finer spirits say it is intelligence (*phronêsis*). But those who take the latter view are not able to say what knowledge is involved and are finally compelled to say that it is knowledge of the good, thereby making themselves laughable. Obviously, such people are talking in a circle, if they fail to elaborate some account of the link between knowledge and the good. On the other hand, those who define the good as pleasure are no less confused in their thinking because they are compelled to agree that there exist bad pleasures. Hence they are admitting the same things to be both good and bad. So it is obvious that there are many disputes about the good, although a unique feature marks it off from other disputed things. Whereas, in the case of just (*dikaia*) and honourable (*kala*) things, many would prefer the reputation without the reality in action, yet where it concerns the good nobody is content with having merely the appearance, since all men seek the reality (τὰ ὄντα), while

the mere appearance satisfies nobody. This is a special characteristic of the good, which makes it the guiding star for all human action.

Socrates underlines (505e–506a) the supreme importance of the good, as that which every soul pursues and for whose sake it acts, although the soul is baffled and unable to grasp its nature adequately, or even attain any
[87] stable belief about it, | unlike other things. In regard to this matter of high importance, one cannot accept such blindness and obscurity in the souls of the best citizens to whom is entrusted the control of all things. Socrates declares (506a–b) that the proposed constitution (of Kallipolis) will only get its perfect and definitive organisation when it is overseen by a guardian who knows exactly the relation between the just and honourable with reference to the good.

Glaucon now (506d) rejoins the discussion, urging Socrates not to draw back when he is within sight of the goal. He speaks for the group in declaring that they will be content if Socrates explains the good in the same way as he sketched the nature of justice, self-control and the other virtues. Socrates agrees that he would also be content with this but fears that his powers may fail and that in his eagerness he may cut a sorry figure and become a laughing-stock. Thus he postpones the question about the nature of the Good (τί ποτ' ἐστὶ τἀγαθόν) as being too high for his impulse to reach and offers to discuss the offspring of the Good and what is most like it. Significantly Glaucon agrees (507a) to the suggestion, so long as Socrates promises to deliver the story of the Good another time. But Socrates expresses doubt about their ability to give and receive the principal sum and not merely the interest.[4] Indeed, he warns his interlocutors to examine the interest payment carefully, so that he doesn't deceive them unintentionally with a false reckoning of the interest.[5]

The Idea of the Good is said subsequently (508e) to be the reality that gives truth (*tên alêtheian*) to the objects of knowledge and also gives the power of knowing to the knower. It must be conceived as the cause of knowledge and of truth insofar as these are known.[6] Thus, despite how noble (*kalon*) both knowing and truth are, one must assume that the Idea of the Good is yet more noble (*kallion*). Notice the careful clarification of the analogy given by Socrates at 508e–509a: just as in the simile of the sun, it is right to regard

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[4] This is a linguistic play on the word for interest in Greek *tokos* = child of the principal.

[5] Plato may be urging his readers to engage in critical scrutiny of the subsequent arguments, given his broad hints that the interlocutors are not well prepared for dialectic.

[6] See Heidegger's phenomenological analysis (2002) of this passage about the good and its connection with truth.

light and vision as sunlike but not as being identical with the sun, so (in the intelligible realm) it is right to consider knowledge and truth as being like the Good (*agathoeidê*) but not as being identical with the Good. Still, the highest honour belongs to the possession and habit of the Good (τὴν τοῦ ἀγαθοῦ ἕξιν). Not only does the sun furnish (*parechein*) to the visibles the power of visibility, but it also provides for their generation and growth and nurture, even though the sun itself is not generated. Analogously, one should say that the objects of knowledge receive from the presence of the Good not only their capacity of being known, but also their very existence and essence (τὸ εἶναί τε καὶ τὴν οὐσίαν) is derived from it, although the Good itself is not essence | (οὐκ οὐσίας ὄντος τοῦ ἀγαθοῦ), but rather transcends essence [88] in dignity and surpassing power (509b).

In this whole passage, Plato deliberately illustrates the generalising and transcending power of the human mind such that, in seeking an ultimate cause, it goes beyond all particularity, images, and even the particular concepts of things. He draws our attention to this transcendent realm by having Glaucon comment (509c) jokingly on the daimonic hyperbole. Socrates lays the blame on Glaucon for compelling him to utter his thoughts about it. But Glaucon persists by encouraging Socrates to expound the simile of the sun, in case there is anything left out. Socrates admits that he is omitting a great deal but promises that, so far as practicable, he will not willingly leave anything out.[7] At this point (509d) Socrates prefaces the simile of the Line by inviting his audience to conceive of these two entities (the Good and the sun) as ruling over the intelligible order and the perceptible region. Then he invites his interlocutors to imagine the two types, the visible and the intelligible in terms of a line divided into two unequal sections, while cutting each section again in the same ratio, i.e. cutting the section of the visible and the intelligible, in the same ratio as the original. I think it is important to keep in mind that the simile of the line is introduced to help the interlocutors gain some understanding of the highest intelligible principle, namely the Good, by means of such images. For those people who are unfamiliar with the imageless thought of dialectic this is the only way to get some inkling of the Good, i.e. by observing its products in the shape of images. This is why Plato introduces the images of the line and the cave at this point in the dialogue, so that the interlocutors who normally think at the level of images can be gently drawn towards a higher level of understanding. In effect, the philosophical

[7] Again Plato hints at the limitations of the audience for understanding advanced dialectic about the Good.

point being conveyed by these images is actually being illustrated through the dramatic activity of the dialogue.

IV. *Conversion of the Soul to the Intelligible Realm*

Since (for my purposes) the image of the cave has little to add to the simile of the Line, I will pass over both rather quickly while identifying some noteworthy points from the perspective of my argument. For instance, one should note that Socrates invites (VII 514a) his interlocutors to compare our nature in respect of education to the situation of the cave dwellers. Subsequently, Glaucon remarks (515a) on the strange images and the odd prisoners, while Socrates responds that they are like us. Thus, one of the functions of the image of the cave is to illustrate the cognitive situation of those whose thinking is dependent on images, and who are subsequently forced to make the transition to imageless thought. Along with the several contrasts which Plato
[89] draws between images and originals, he also | emphasises the element of compulsion that is necessary to set off the process of conversion from image to original, which is accompanied by much confusion and even pain. For instance, with regard to any of the originals whose shadows are being cast on the wall, the released prisoner would be at a loss to say what it is. And if he were compelled to look at the light itself, this would pain his eyes, so that he would be inclined to turn back and flee towards the familiar shadows that he is able to discern (and which he mistakenly regards as being in fact clearer than the objects pointed out). As Socrates indicates later (517a–b), these two cognitive conditions correspond to what were called belief and conjecture, corresponding to the sensible division of the Line.

From my point of view, however, the more interesting aspect of the cave image involves the way it illustrates the intelligible division within the Line. According to Socrates (516a), when the prisoner emerges into the light, he will be unable to see even one of the things we call real. Socrates suggests that he would need some habituation (*synêtheias*), if he is going to be able to see things higher up. The process of habituation is described as follows: at first, he would most easily discern the shadows and, subsequently, the likenesses or reflections in water of men and of other things; and after that the things themselves. Progressing from these, he would later contemplate the appearances in the heavens and heaven itself but most easily by night, looking at the light of the stars and the moon more easily than (looking) by day at the sun and its light. Eventually, he would be able to look at the sun itself and see its true nature, not merely through reflections in water or

phantasms of it in another setting but in and by itself (αὐτὸν καθ' αὑτόν) in its own place. At this point (in his intellectual journey), the released prisoner would be able to conclude (*syllogizoito*) that it is the sun which provides the seasons of the year, and presides over all things in the visible region, and that this is in some way the cause of all these visible things. What is being illustrated here by Plato is the cognitive conversion from images to originals that accompanies the search for general causes, which culminates in a vision of the Good as the most universal cause.

However, what most interests me about the simile of the cave are its educational implications, which are spelled out by Socrates at 518b–c. If this is true, he says, then education (*paideia*) is not in reality what some people proclaim it to be in their professions.[8] What they claim is that they can put true knowledge (*epistêmê*) into a soul that does not have it, as if they were inserting vision into blind eyes. By contrast, Socrates insists (518c) that the present argument indicates that the true analogy for this indwelling power of the soul, and the instrument by which each of us apprehends (*katamanthanei*) is that of an eye that can only be converted (*strephein*) to the light from darkness by turning the whole body. Even so, this organ of knowledge must be turned around from the world of becoming, | together [90] with the entire soul, like the scene-shifting periact[9] in the theatre, until the soul is able to endure the contemplation of essence (τὸ ὄν) and the brightest region of being (τοῦ ὄντος τὸ φανότατον), and this is what we call the Good.

Socrates accepts (518d) that there might be an art of conversion, i.e. of the quickest and most effective conversion of the soul, but denies that there is an art of producing vision in it. Such an art is based on the assumption that the soul possesses vision but does not rightly direct it and does not look where it should, so that the art is that of redirecting its gaze. A significant contrast is drawn (518d–e) with the other so-called virtues of the soul, which seem to be akin to the body, since where they do not already exist, they can later be produced by habit (*êthesi*) and practice (*askêsesin*). But the excellence of thought (*phronêsis*) happens to be a more divine quality, as it never loses its power (*dunamis*) but rather becomes either useful and beneficial or useless and harmful, depending on its orientation.

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[8] Perhaps a reference to advertisements of sophists; see *Prot*. 319a; *Gorg*. 447c; *Lach*. 186c; *Euthyd*. 273e; Isocrates, *Against the Sophists* I, 5, 9, 10; *Antidosis* 193.

[9] Analogy with *periaktoi* or triangular prisms on each side of stage in the ancient theatre. They revolved on an axis with different scenes painted on their three faces.

The next step in the inquiry is to consider how philosopher-rulers can be produced in the city, and how they may be led upwards towards the light, as some heroes are fabled to have ascended from Hades to the gods. Glaucon is anxious to hear about this, but Socrates warns him that it is no easy matter, as it involves a conversion of the soul away from a day whose light is darkness towards the veritable day. This is the ascent to reality involved in the parable of the cave, which is affirmed to be true philosophy. Thus Socrates proposes to consider what disciplines have the power to draw the soul away from the world of becoming to the world of being. Socrates recalls (521d) their previous statements that the young guardians must be athletes of war, so that the discipline being sought should not be useless for soldiers. He also recalls that, in the previous account (376e), the soldiers were trained in gymnastics and music. But gymnastics is devoted to that which grows and perishes, since it presides over the growth and decay of the body. So this is not the discipline (*mathêma*) being sought, but perhaps music will fit the bill. Yet that is also rejected (522a), since it educates the guardians through habits, imparting by melody a certain harmony of spirit (*euarmostian*) that is not science but rather a certain measure and grace (*euruthmian*) with respect to rhythm. Furthermore, as Glaucon recalls, music included no study (*mathêma*) that could lead someone towards the goal being sought (i.e. conversion of the soul).

Socrates praises (522b) Glaucon's recollection as being most exact but yet he himself appears to be stymied in his search for a suitable discipline, since all the arts are regarded as base, and there seems to be nothing else besides music, gymnastics, and the arts. Thus they must look for something that applies to all of these alike and Socrates suggests (522c) that it may be the common thing which all arts and forms of thought (*dianoias*) and sciences (*epistêmai*) employ, and which is among the first things that everybody must learn. Glaucon is puzzled and Socrates explains it as the trifling matter of
[91] distinguishing one and two and three. In general, | he has in mind number and calculation, which every art and science is forced to use, even the art of war. But this little step already involves a generalisation to something common, just like the cognitive approach to the Forms.

Consequently, Socrates suggests (522e) that they agree to set down as a study necessary for a soldier the ability to reckon and number. Glaucon (the war lover) agrees that this is most necessary if he is to know anything of the ordering of troops, or even if he is to be a man. Socrates warns (523a) that this obsession with usefulness in war has obscured the true usefulness of arithmetic, since it is one of those studies that is naturally (*phusei*) conducive to the awakening of thought. Although it does tend to draw the mind towards

essence and reality (πρὸς οὐσίαν), yet no one uses it properly. Glaucon is puzzled and Socrates suggests that some reports of our perceptions do not provoke a reconsideration because the judgments by sensation seem adequate, whereas others always invite the intellect to reflection because nothing sound is produced by the senses. Glaucon assumes (523b) that Socrates has in mind distant appearances and shadow-paintings, but Socrates declares him to have missed the point. This is a typical dramatic ploy by Plato to draw our attention to the real point at issue, namely, that not all sensible experiences tend to stimulate intellectual reflection.

Socrates later explains (524d) that the point he was trying to make when he said that some things are harbingers of thought, while others are not, is that those things are provocative which impinge on the senses together with their opposites, whereas other things do not tend to awaken reflection. Glaucon finally understands and accepts the point. Socrates asks him to consider to which class of things number and the one belong, but again Glaucon has no idea. Socrates invites him to reason it out from what has been said before. If the one is adequately seen itself by itself or is grasped by some other sensation, it would not tend to draw the mind to the apprehension of essence, as was the case with the finger. On the other hand, if some contrary is always seen along with it, so that it no more appears to be one than the opposite (plurality?) then there would be a need for something to judge between them and it would compel the soul to be at a loss and to inquire by arousing thought (τὴν ἔννοιαν) in itself.

It is as a result of such puzzlement that the soul is provoked to ask: 'What is the one itself?' Consequently, the study (*mathêsis*) of the one will be among the studies that guide and convert the soul to the contemplation of true being (ἐπὶ τήν τοῦ ὄντος θέαν). Socrates claims (525a) that the visual perception of the one does involve this confusion of opposites, since we see the same thing simultaneously as one and as an indefinite plurality. But if this is the case for the one then it holds also for all number, presumably because one is the principle of number. Furthermore, reckoning (*logistikê*) and arithmetic are concerned with all number, and these appear to lead to the truth, so that they would belong among the studies required for the conversion of the soul. For a soldier must learn them in order to marshal his troops, and a philosopher to ascend out of the region of generation and | to lay hold of true being (τῆς [92]
οὐσίας), otherwise he will never become a true reckoner. This is relevant for the construction of the ideal city because the guardian is both a soldier and philosopher. Hence Socrates suggests to Glaucon that it is fitting that this branch of learning (*mathêma*) should be prescribed by law and that they should persuade those who are to share in the highest functions of state to

enter upon the study of calculation, and to pursue it until they attain a vision of the nature of numbers (τῆς τῶν ἀριθμῶν φύσεως) by pure thought (τῇ νοήσει αὐτῇ). In effect, they should not pursue these studies for the sake of buying and selling, as if they were preparing to be merchants or hucksters, but rather for the uses of war and for the conversion of the soul itself from the world of generation towards essence and truth (ἀλήθειαν καὶ οὐσίαν).

The crucial point here (525d–e) concerns the right approach to the study of calculation, namely, that it strongly leads the soul upwards and compels it to discourse about pure numbers, while not accepting into the discussion of numbers any visible and tangible bodies. In support of this approach, Socrates cites the attitude of experts in this study, namely, if anyone tries to cut up the one in argument, they will laugh at him and refuse to accept it. And if someone breaks it down, they multiply, always on guard lest the one should appear to be not one or a multiplicity of parts.[10] Now suppose someone were to ask them about the sort of numbers they are talking about, in which the one is such as they postulate, i.e. each unity is exactly equal to every other without the slightest difference, and admitting no division into parts. They would probably answer that they are speaking of units which can only be conceived by thought, and which it is not possible to deal with in any other way. Thus Socrates concludes (526a–b) that this discipline is indispensable for conversion, since it plainly compels the soul to employ pure thought with a view to truth itself. He cites some empirical evidence for the advantages of this discipline, i.e. that natural reckoners are by nature sharp in all their studies, while the slow learners become quicker than they were, when they are drilled and trained, even if no other benefit accrues, such as their conversion to a theoretical approach. Furthermore, it is not easy to find studies that demand more toil in learning and practice. For all these reasons, Socrates says (526c), we should not neglect this study but rather use it in the education of the best endowed natures.

Having established this first point about the curriculum of studies for the philosopher-rulers, Socrates wonders (526c) what other study is suitable for second place, and Glaucon conjectures that it is geometry.[11] As a lover of war, he readily accepts as suitable that part of geometry which applies to the conduct of war because a military leader who has studied geometry is very different from one who has not, when dealing with encampments and the occupation of land, and bringing troops into line and all the other

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[10] Cf. *Parm*. 159c, *Phdr*. 266b, *Meno* 72c, *Leg*. XII 964a, *Soph*. 251.

[11] For the traditional order of mathematical disciplines see Isocrates, *Antidosis* 261–269, *Panathenaicus* 26, *Busiris* 226.

foundations of an army in battle or on the march. | However, Socrates points [93]
out (526d) that a modicum of geometry and calculation would suffice for such purposes. Instead what he wants to consider is whether the great and more advanced part of it tends to facilitate the apprehension of the Idea of the Good.[12] Socrates repeats that this tendency is to be found in all studies that force the soul to turn its vision around to the region where dwells the most blessed part of reality (τὸ εὐδαιμονέστατον τοῦ ὄντος), which it is imperative for it to behold in every way. Once again, we find here (526c) an explicit application of the agreed criterion: if it compels the soul to contemplate essence (*ousian*), then it is suitable, but not if it turns the soul towards generation.

Subsequently, Socrates goes on to consider other mathematical disciplines, such as stereometry and astronomy, and concludes that they can also convert the soul towards the intelligible world so long as they are studied in the right way. For instance, he criticises the exclusively empirical approach to astronomy that is adopted by contemporary astronomers who spend their time gazing up at the heavens. The crucial point (529d) is that the real objects of astronomy can be grasped only by reason and by thought and not by sight. Furthermore, Socrates explains how the science of astronomy should be studied for theoretical purposes. We must use the decorations of the heavens as patterns to aid in the study of these (invisible) realities, just as one would do who chanced upon diagrams drawn with special care and elaboration by Daedalus or some other craftsman or painter. Socrates spells out (529e) the analogy with geometry: anyone expert in geometry who saw such designs would admit the beauty of workmanship but would consider it absurd to examine them seriously in the expectation of finding in them the absolute truth with regard to equals or doubles or any other ratio.

Socrates holds (531c–d) that if the investigation of all these studies proceeds far enough to bring out their community and kinship with one another and to infer their affinity, then their study will contribute to the desired goal, and the labour will not be in vain. We should notice here that Plato assumes that it is possible to generalise across all the mathematical disciplines in search of higher theoretical causes. Glaucon accepts (531d) this proposal from Socrates but remarks on the vastness of the task being undertaken. Socrates replies that this is merely a prelude or preamble to the

[12] P. Shorey in a footnote to his translation (1935: 168) explains that it is because it develops the power of abstract thought, and not because numbers are deduced from the Idea of the Good.

law itself or to the song which we must learn.[13] By way of clarification, Socrates points out (531d–e) that the experts (in harmonics and astronomy) are not dialecticians, and Glaucon agrees emphatically.[14] But, Socrates argues (531e), whoever cannot give and receive an account cannot be said to know (*eidenai*)
[94] anything (i.e. causes).[15] Glaucon agrees (532a) and Socrates emphasises | that this is the song (*nomos*) which dialectic recites. This upward tendency is imitated by the faculty of vision when it first tries to look at living things themselves (αὐτὰ τὰ ζῷα), then at the stars, and finally at the sun. Similarly, when anyone tries by means of dialectic to proceed through reason (διὰ τοῦ λόγου) without the senses to find his way to the very essence of each thing and does not stop until he grasps by thought the nature of good in itself, then he arrives at the limit of the intelligible, just as in the simile of the Sun, one arrives at the limit of the sensible.

V. *Dialectic as the Coping-Stone of the Curriculum*

Socrates asks Glaucon (532b) to accept that such a journey in thought is to be called dialectic. He recounts (from the myth of the Cave) the release of the prisoners from bonds, the conversion from the shadows to the images or idols that cast them, and towards the light, and finally the ascent from the cave to the world above. In that daylight world, the progress of inquiry is marked, first, by the inability to look directly at animals and plants in the sunlight, while being able only to see phantasms created by God in water and shadows of objects that are real, and not merely (as before) the shadows of images cast through the light of the fire, which is just as unreal as they are when compared to the sun. All this procedure of the arts, which has been described, indicates their power to lead the best part of the soul up to the vision of what is best among realities, just as in the myth the clearest organ of the body was turned to the vision of what is brightest in the corporeal and visible region.

Glaucon accepts (532d) this as the truth, so that they can proceed to the melody/law itself, having already gone through the prelude. Thus he asks

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[13] See *Leg*. IV 722d–723b, 720d–e; IX 870d, 854a; XI 932a for technical sense of *prooimion* to a law.

[14] Plato's target may have been some obdurate mathematicians within the Academy, such as Eudoxus, who developed the general theory of proportion.

[15] For the Platonic criterion of dialectic see *Rep*. 534b; *Prot*. 336c; *Pol*. 286a; *Theaet*. 202c, 175c, 183d; *Soph*. 230a; *Phd* 78c–d, 95d; *Charm*. 165b; Xenophon, *Economics* 11. 22.

Socrates to describe for him the character of this power of dialectic, including the kinds into which it is divided, and what are its ways. Glaucon also expects that these dialectical methods would lead them to the place where they could rest on the road, as it were, and then come to the end of the journey. However, Socrates suggests (533a) to Glaucon that he may not be able to follow him any further, though there is no lack of good will on his part. Despite these human limitations, Socrates speaks of a vision of the very truth rather than images of his meaning, though he will not assert dogmatically that he is able to achieve this. But he does affirm that something like this (imageless) vision of the truth is the goal they have to achieve. He also asserts that nothing less than the power of dialectic could reveal this reality, and only to someone experienced in the studies already described.

Furthermore, Socrates claims that no one can dispute this by suggesting that there is some other way of inquiry that tries systematically and in all cases to grasp what each thing really is. All the other arts have for their objects the opinions and desires of men or are wholly concerned with generations and compositions or with the service and tending of things that grow and are put together. On the other hand, the remainder of the arts or sciences which do lay hold of reality, such as | geometry and its companion studies, [95] are merely dreaming about being (τὸ ὄν), while a clear waking vision of it is impossible for them, so long as they leave their hypotheses undisturbed and cannot give any account of them (533c–d). Socrates' rationale is as follows: where the starting-point is unknown by the reasoner then the conclusion and all intermediate steps are not really known, so there is no possibility that assent in such cases can ever be converted into the knowledge or science (*epistêmê*).[16]

Socrates insists (533c–d) that dialectic is the only process of inquiry that advances in this way by doing away with hypotheses and going up to a first principle in order to find confirmation there.[17] He insists that, in reality, when the eye of the soul is sunk in a barbaric slough[18] then dialectic gently draws it forth and leads it up, using as helpers in this conversion the studies

[16] Since everything depends on the reliability of the first principles, how are they known? This is a problem that Aristotle inherited from Plato and tried to solve in his own way.

[17] Dirk Baltzly (1996) discusses the identity and character of this un-hypothetical first principle, and concludes that it is more like Aristotle's principle of non-contradiction than the Platonic idea of the Good, which one might be tempted to assume from the dialogical context. According to Baltzly, the character of this dialectical principle as absolutely prior is established by the fact that its opposite is self-refuting.

[18] P. Shorey (1935: 204) thinks the image is Orphic, i.e. the myth of impious souls being buried in the mud of the world below.

enumerated, which from habit we often call sciences though they ought to have another name which connotes something clearer than opinion but more obscure than science. Socrates refers back to the simile of the line for the name 'understanding' (*dianoia*), but he presumes that they will not dispute about the name when things of great importance lie before them for inquiry. Socrates briefly reviews (533e–534a) the conclusions of the line simile and asks for the agreement of Glaucon: the first division is called science, the second understanding, the third belief, and the fourth conjecture, while the last two collectively are called opinion and the first two together are called intellection. While opinion deals with generation, intellection deals with essence (*ousia*), and their relationship is expressed in a proportion: as essence is to generation, so is intellection to opinion. Similarly, as intellection is to opinion, so is science to belief, and understanding is to conjecture. Significantly, Socrates (534a) sets aside the question of the relationship between their objective correlates, and the division into two parts of each of these, namely the opinable and the intelligible, so as to avoid an even longer discussion than before.[19]

Again Glaucon agrees (534b) to all this with the usual qualification, namely, 'insofar as I am able to follow'. Socrates asks him also to agree to give the name 'dialectician' to the man who is able to receive an account of the essence of each thing (534b). This can also serve as a disqualifying criterion because the man who is unable to do this, insofar as he is incapable of rendering
[96] an account (λόγον | διδόναι) either to himself or to others, cannot be said to have full reason and intelligence about the matter. Socrates asserts (534b–c) that the same is true for the good, namely, the man who cannot abstract the Idea of the Good from all other things and define it in his discourse, and who cannot undergo all tests, as in battle, striving to examine everything according to essential reality and not according to opinion, and who cannot travel through all this without tripping up in his reasoning, then such a man does not really know the Good Itself or indeed any particular good. But if he somehow grasps an image of it, his contact with it is by means of opinion and not knowledge, so that he dreams and dozes through his present life and, before he ever awakens here, he will arrive at the house of Hades and fall asleep forever. Glaucon agrees with great alacrity, presumably unaware that he himself may be classed among the sleepers.

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[19] Do such objective correlates exist for each section, as C.D.C. Reeve (1988) thinks, or is Plato hinting that there is a different method of inquiry for approaching the same objects in different ways within the sensible and intelligible realms, respectively?

Socrates now (534d–e) spells out the implications for educating the rulers: if one is nurturing and educating future rulers, even in word, as is now the case with the lawgivers of Kallipolis, one would not allow them to rule in the city and determine the greatest matters, while they are irrational, like lines in geometry. Glaucon agrees that they should legislate this and Socrates asks him also to agree to set dialectics above all other studies, as a kind of coping-stone, so that no other study could be rightly placed above it. Socrates indicates (535a) that their study of the disciplines is now complete. The remaining task is to decide to whom the law-givers should assign these studies and in what way. Socrates reminds (535a) his interlocutors (as fellow lawgivers) about the kind of men they previously chose for rulers (412d–e, 485a–487e, 503a, c–e). He reaffirms that they should choose the same natures; the most stable, the most brave and enterprising are to be preferred, and also the most handsome, so far as possible. In addition, Socrates emphasises (535b), we must require that these people not only be virile and vigorous in temper but that they also have the gifts of nature suitable to this type of education. Glaucon seems to have forgotten which characteristics are required and Socrates reminds him, namely, they must have a certain keenness for study and must not learn with difficulty. The reason is that souls are more likely to flinch in severe studies than in gymnastics because the toil touches them closer to home, being peculiar to them and not shared with the body. Furthermore, Socrates recalls (535c), we must require in such people a good memory and doggedness and industry in every sense of the word; otherwise they may not consent both to undergo all the toils of the body and also to complete so great a course of study and discipline.

Socrates diagnoses (535c–d) the present mistake and consequent disgrace of philosophy as being caused by the unfitness of her associates and suitors, since they should not be illegitimate but rather true-born sons. Glaucon demands clarification and Socrates explains (535d) that, in the first place, the aspirant to philosophy must not limp in his industry, with one half of him loving, while the other half shuns, toil. This happens when someone is a lover of gymnastics and hunting and | all the labours of the body, yet is not [97] fond of learning or of listening or inquiry, but rather hates work. Similarly hobbled is someone whose industry is one-sided in the reverse way (i.e. love of mental but not of physical discipline). Glaucon responds (535d) that this is most true, which apparently reminds Socrates of truth because he says that with respect to truth a soul is likely to be maimed, which cheerfully accepts involuntary falsehood and is not distressed by its own lack of knowledge but rather wallows in the mud of ignorance like a pig (535e). Yet such a soul may still hate the voluntary lie in itself and others.

Furthermore, with reference to self-control and bravery and loftiness of soul and all the parts of (moral) virtue, Socrates warns (536a), that we must be on our guard to distinguish the base-born from the true-born. The reason is that when the knowledge which is necessary to make such discriminations is lacking in the individual or in the city, they employ at random the crippled and base-born natures as their friends or rulers. Glaucon agrees (536a) that this is the case and Socrates repeats (536b) the warning that they should only bring men who are sound of limb and sound of mind to so great a study and discipline, so that justice (*dikê*) will find no fault with the lawgivers who are to preserve the city and the constitution. But, on the other hand, if we introduce the opposite sort into philosophy, the outcome will be the direct opposite, and we will pour a greater flood of ridicule on philosophy. Socrates expresses the fear that his own intensity will make him look ridiculous, since he forgot that they were merely playing and thus spoke with excessive intensity. Socrates explains that when he saw how philosophy is undeservedly reviled, he was revolted and spoke too earnestly to those at fault. Glaucon assures (536e) him that he did not speak too earnestly for him as a hearer, but Socrates insists that he spoke too earnestly as a speaker. In addition, he reminds them that they must not choose old men for such education, despite Solon's maxim that in growing old a man is able to learn many things (536d).[20] In fact, an old man is even less able to learn than to run a race, since all heavy and frequent labours belong to the young (cf. *Theaet*. 146b).

Socrates lays out (536d–e) some of the implications for the proposed curriculum of studies: all the study of reckoning and geometry and all other preliminary studies that are essential preparation for dialectic must be presented to them while still young, but not as compulsory instruction. The reason is that a free soul should not pursue any study slavishly, since nothing learned under compulsion stays in the mind, though bodily labours performed under constraint do not harm the body. Thus Socrates recommends that children not be kept to their studies by compulsion but rather by play (*Leg*. VII 819b–c; I 643b–d; VII 797a–b; *Pol*. 308d). In this way, one can better discern the natural capacities of each child (537a). Socrates reminds Glaucon of the previous suggestion that children be allowed to
[98] be observers of war at a safe distance on horseback, so as to give them a | taste of blood, like hunting dogs. Later in their studies, those young men who show the greatest facility in all these toils and studies and alarms should

[20] Compare Solon's fragment: γηράσκω δ' ἀεὶ πολλὰ διδασκόμενος. Fr. 18, West; also *Lach*. 188a–b.

be selected and enrolled on a list. This is to happen after their period of gymnastic training, which takes two or three years, during which they are incapacitated for other activities. Socrates explains (537b) that fatigue and sleep are the enemies of study, and recalls that one of the great tests of the young guardians was how they behaved during physical exercises.

Glaucon agrees and Socrates proceeds to specify that those who are given preference will receive greater honours than others. They will also be required to gather their previous studies as children into a comprehensive survey of their affinities with one another and with the nature of things (τῆς τοῦ ὄντος φύσεως). Once again, the implicit assumption is that the way to the highest causes is through generalisation. Glaucon accepts (537c) that this is the only sort of instruction which remains fixed with those who receive it. Socrates emphasises that this is also the chief test of the dialectical nature and its opposite; for whoever can view things in their (universal) connection is a dialectician and whoever cannot do so is not a dialectician. Plato seems to be talking about the power of abstract generalisation, such as is displayed in his *Parmenides* dialogue. Socrates instructs Glaucon (as joint lawgiver for Kallipolis) to make a selection, while keeping these qualities in mind, of those who display them best from among the group who are steadfast in their studies and in war and in all other lawful requirements (537d). When these selected youths have passed 30 years of age, they should be promoted by means of a second selection from those preferred in the first and given greater honours. And they must be proved and tested by the power of dialectic to see which of them is able to disregard the eyes and the other senses, and to continue their intercourse with the truth. This is clearly Plato's way of describing imageless thought about pure Forms.

Socrates subsequently (539d–e) suggests that a period of five years be devoted to the continuous and strenuous study of dialectics, undisturbed by anything else, just as in the case of bodily exercises. After they have finished this period of study, the lawgiver will send them down into the cave again, and compel them to hold commands in war and other offices suitable to youth, so that they will not lack the other type of experience. In these offices they are to be tested to see whether they will remain steadfast under diverse solicitations or whether they will flinch and swerve. Socrates proposes (540a) that they be allowed fifteen years for these activities, so that at the age of fifty these guardians who have survived the tests and proved themselves best in every task and every form of knowledge can at last be brought towards the goal. Socrates emphasises (540a) that the lawgivers are trying to force the future rulers to turn upwards the gaze of the soul and to fix their gaze on that which sheds light on all. When they have contemplated the Good Itself, they will use

it as a pattern for the right ordering of the city and of the citizens themselves. When his turn for ruling comes around, each philosopher-ruler turns away
[99] from the study of | philosophy, where he spends most of his time, to take up positions of service in the city, holding office for the sake of the city and adopting the attitude that ruling is not a fine thing but a necessity. Thus, when the older generation selects educated people like themselves to take their place as guardians of the city, they shall depart to the Islands of the Blest and dwell there. And the *polis* shall establish public memorials and sacrifices for them as if they were divinities, if the Pythian oracle approves, but if not, then as if they were divine and godlike men.

Conclusion

In this paper, I have offered a reading of *Republic* VI–VII in terms of Plato's attempt to resolve a central problem of Socratic intellectualism, namely, to give some good reason (other than appealing to luck) why Socrates himself was motivated to inquire into virtue, so as to correctly interpret the command of the god. Instead of relying on luck or divine accident, Plato wanted to ensure that society will have sufficient people like Socrates with his motivation, character, and philosophical activities, by making all of these depend on education. Such an education will produce both moral and intellectual virtue, in the sense that good souls are prepared to recognise the highest truths. Furthermore, the philosophers who are produced through such education will be acknowledged as moral authorities and obeyed by people who are not so good; and so they will have *aretê* in the ordinary Greek sense of public status and success. In this way, perhaps Plato hoped to avoid the tragic fate of Socrates who was condemned to death, despite being the best of men. The acid test for Kallipolis as a good society is that there will be complete harmony between the values of the *polis* and of the best people who are pursuing the best life, namely, the life of philosophy. Furthermore, the development of moral and intellectual virtue in such people is not merely the result of divine chance, as in the case of Socrates, but rather is a product of systematic education in mathematics and dialectic, which leads them to universal knowledge of the good. Thus Plato's solution to the problem which we call Socratic intellectualism is to make the development of moral character through training and habituation of the emotions an essential prerequisite for proper use of dialectic. This is the point of his warning against allowing young men to engage in dialectic before their characters become mature and steady, since natural cleverness (such as

that of Alcibiades) is morally ambiguous and so can be used for either good or evil purposes. Incidentally, Plato's solution is reflected in Aristotle's later distinction between sophists and dialecticians in terms of their 'choice of life' (*prohairesis biou*).

For Plato the vision of the good also involves doing the good, and so he appropriates and develops the profound moral insight of Socrates who denied the possibility of *akrasia*, i.e. of genuinely knowing the good, while doing evil. Plato introduces the tripartition of the soul to explain the phenomenon of internal psychic conflict, while emphasising the necessity for reason to master the lower desires. In | a harmonious soul, where reason is master, [100] there is no longer any possibility of knowing the good while doing evil; and the same is true in a harmonious *polis* where philosophers rule. For Plato this represents the triumph of the divine in human affairs, namely, the triumph of reason, whereby human beings imitate the divine. The basic optimism of Plato about the capacity of human reason to guide all things rightly should not be obscured by Christian pessimism about human nature, with its Judaic myths about the Fall. Such Judaic-Christian assumptions about the tendency of human reason to transgress God's law represent perhaps the greatest obstacle to a proper understanding of the Greek notion of human reason and its divine character. It seems to me no accident that Karl Marx returned to the Greek tradition for a positive vision of human possibilities in developing his central notion of human praxis. With the collapse of communism at the end of the twentieth century, however, it remains an open question as to whether his optimistic vision of humanity is still defensible. Perhaps the pessimistic Judaic-Christian vision of mankind as essentially sinful should temper our optimism about the capacity of human reason to discover and do the good. In the realm of politics, for instance, we might refuse to install philosopher-rulers as absolute monarchs, being mindful of Lord Acton's warning that all power tends to corrupt and absolute power to corrupt absolutely.

Introduction

If one compares the curriculum of education for citizens outlined in Plato's *Republic* with that outlined in Plato's *Laws*, then one may be puzzled about the relatively minor role which mathematics plays in the education of citizens of Magnesia in the latter work. Practically all that one finds in the *Laws* is a brief outline in Book VII of a basic curriculum in arithmetic, geometry and astronomy, which is prescribed for the ordinary citizens. Of course, if the *Laws* is not chiefly concerned with the education of philosopher rulers, as is the *Republic*, then mathematics will not be so important as the propaedeutic discipline that prepares the soul for the ascent to dialectic. This prima facie solution to the puzzle seems to be confirmed by *Laws* Book XII, which sketches a broader curriculum in mathematics as part of the education of members of the Nocturnal Council, who are most like the philosopher rulers of the *Republic* in that these elite few will have exact knowledge (818e).

However, the comparison with the *Republic* also reveals that the *Laws* is primarily concerned with the basic education of the ordinary citizens of Magnesia, and only secondarily with the education of the ruling elite. This is the so-called 'little paideia' (σμικρὰ παιδεία, 734e6–735a4) introduced early in the work, which is explicitly contrasted with the more exact paideia (ἀκριβεστέρα παιδεία, 670e, 965b) envisaged for members of the Nocturnal Council. On the other hand, however, the whole of the *Laws* is intended to function as an educational work, both for ordinary citizens and for the rulers, so that the specific regulations about education given in Book VII must be understood within this broader context. The evidence that Plato conceived of legislation itself as an important instrument of political education is to be found in the elaborate prefaces which he appended not only to each specific piece of legislation but also to the *Laws* as a whole. For instance, we might read Book X as a belated preface to the whole work and also there is an elaborate proemium to be found in Books IV and V by way of formal introduction to the legislation being proposed for the colony of Magnesia. However, with reference to education in the narrower sense, the most striking innovation in *Laws* Book VII is the amount of attention which is devoted to the nurture and upbringing of young children, who are said to be governed mainly by pleasure and pain. | Indeed, it is fairly clear that Plato anticipated [166]

Aristotle's view that the proper control of pleasure and pain is essential for the development of the right habits that provide the foundation for virtue.

In this paper, however, I want to argue that the work called the *Laws* was written by Plato as a paradigmatic text in prose literature that is being offered for the education of the ordinary citizens of Magnesia, but especially for the Law Warden who is to supervise the education of children. The *Laws* itself is the very model of 'serious drama' that is required to replace tragedy and comedy (as prescribed by the *Republic*), and will promote morality and happiness by imitation of the divine, i.e. by teaching the same views about the same things in a fixed constitution. It would appear that the major purpose of most educational activities is the preparation for war, e.g. gymnastics and also music, since the best dances and tunes are warlike. But Plato insists that war itself is not a serious business, except when it is pursued for the sake of peace. This is a continuation of his explicit criticism of Spartan education, already begun in *Laws* Books I and II, on account of its obsession with military virtue and its neglect of temperance and justice. Even though Plato declared his admiration for the Spartan constitution in the *Republic* (544e, 545b), it is clear in the *Laws* that he was very critical of the ethos of contemporary Sparta. For instance, he examines the unthinking way in which the poems of Tyrtaeus (*Laws* 629b, 660e) are learned by rote and used to glorify war and its rough justice. Such unreflective admiration for military virtue leads to excessive emphasis being placed on gymnastic training, with a consequent neglect of cultural training, and this produces a type of citizen who is brave on the battlefield but who lacks temperance in peacetime. For Plato the fundamental error involved in this type of military education is the failure to realise that care of the soul is prior to care of the body, since all the virtues are unified through the soul and it is not possible to develop the genuine virtue of courage without temperance and the other virtues. So Plato's project in the *Laws* may be seen in terms of his attempt to provide a complete education for all the citizens through legislation as the most comprehensive form of political education. In making this attempt, he moves beyond poetry to philosophy.

I. *Gymnastics: War Games for the Body*

After considering the proper birth of children, in *Laws* Book VII the Athenian Stranger insists that their nurture (τροφή) and education (παιδεία) are unavoidable topics, although they are more suitable for precept and exhortation than for legislation. Here Plato is quite deliberately transgressing

the traditional boundary between public and private, especially in ancient Athens where the education of children was a family matter,[1] but he is convinced that something of such importance cannot be left to chance because it has serious implications for public order. As he points out at *Laws* 788a–b, if people get used to breaking the law in trivial family matters, this will undermine the authority of the written law. Thus the Stranger proposes as a criterion of proper nurture that it must be capable of making bodies and souls as beautiful and as good as possible. In the case of the body, the guiding | maxim is that beautiful bodies must grow as straight as possible and [167] for this purpose children must be given the right sort of exercise, even while they are in the womb. Behind this maxim lies an odd physiological theory that pathological conditions of the soul result from improper motions (of the body), so they must be corrected through the proper opposing motions, e.g. by rocking children in the womb and in the cradle. Therefore, the Stranger is prepared to expose himself to ridicule by daring to propose legislation governing the appropriate exercise to be taken by pregnant women. The point of proposing such apparently trivial rules is to draw the attention of the master of each household to the close connection between private and public order, so that he will put his own house in order and thereby provide a stable foundation for the laws that govern public affairs (790a–b).

The guiding purpose of gymnastic training according to the proposed legislation is to prepare the citizens for war. Given that Magnesia is not an expansionist *polis*, unlike the feverish city in the *Republic*, we might wonder as to why the preparation for war plays such a central role in its educational system. One answer seems to be that a main function of the citizens who are being trained at public expense will be to defend the *polis* against enemies, whether these be external or internal. Thus, even in their infancy, their bodies and souls must be given the right kind of motion that will promote physical courage and a cheerfulness of soul that is conducive to courage. But behind this apparent pragmatism lies a deeper rationale for promoting cheerfulness of the soul, namely, that this cheerfulness is also the condition of the divine, and so the citizens will be following the right way of life which consists in finding a middle way between the excesses of pleasure and pain (792c–d). Here the old Platonic ideal of *homoiôsis theôi* plays an implicit yet very important role. But there is a different explicit rationale for introducing

[1] My historical claim is confirmed in Aristotle's *Politics* VII–VIII, where his proposals for a common education for the best *polis* are made against the standard Greek practice of leaving the education of children to the discretion of each private household.

the apparently trivial legislation to govern the nurture and education of children. This is the noteworthy fact that ancestral customs usually provide the foundations for written laws, which are both derived from and supported by traditional usage. Consequently, the Stranger has good reason to warn the legislator to pay close attention to maintaining traditional customs and usages in the *polis* because rapid changes in them tend to undermine the written law. Such is the rationale given for the careful supervision of children's games in the public space of the temples under the watchful eyes of people chosen especially for that purpose by the Law Warden, who is responsible for education. Here we have one of the first explicit justifications for public education as an essentially political activity, by contrast with the traditional Athenian attitude to education as a private matter for each household. In order that it will not be left to chance or to the whim of the parent or child, Plato transfers control of education from the household into the hands of a specially chosen Law Warden, whom we might call the Minister for Public Education. Although this would be a complete novelty in ancient Greece, Plato insists that this is the most important office in the *polis* (765d).

At *Laws* 804d he tries to justify compulsory education by claiming that children belong to the *polis* first, and to their parents second. This may look like a totalitarian claim to us, but within the ancient context it is quite consistent with a common belief in the primacy of the *polis*. Since Plato holds that education is fundamental for civic life, he is not willing to leave it to the caprice of parents who may not understand its importance. Thus the legislation for Magnesia requires the establishment of gymnasia both in the centre and in the suburbs for the practice of war games, such as wrestling,
[168] archery, and horse riding, which are to be taught | by foreign experts.[2] The laws also require that the same gymnastic education be given to men and women, if the latter are willing and able to participate. In order to show that this is not a ridiculous proposal, the Stranger refers to the mythical Amazons and to the living example of the Sarmatian women who engage in warfare just like men. But the real point of the proposal is to promote social solidarity in the *polis*. If one wishes men and women to have a common purpose, it would be a great blunder on the part of the legislator to neglect the education of one half of the *polis*. And if women are not to share in the same education as men, there must be some other system of rules that govern their lives, otherwise they

[2] Why the dependence on foreign experts? Given Plato's emphasis upon the self-sufficiency of the ideal city, it is rather strange that he should allow foreign experts to teach gymnastics, especially since this was a function often performed by travelling sophists.

may become a potent source of anarchy within the *polis*. Thus the Stranger conducts a brief comparative survey of the existing codes by which women live in Thrace, Athens and Sparta. In Thrace women are treated more like slaves, since they work in the fields and mind livestock, while in Athens they are confined to working in the home like other household servants, though they are ostensibly free citizens. According to the Stranger, the women in Sparta are given enough education in gymnastic and music to fashion for themselves a relatively worthwhile life, even though they do not perform military service and so cannot participate fully in civic life. In fact, all the historical reports we have about Spartan women attest that they were unruly and licentious, as well as being lovers of wealth and luxury.[3]

Therefore, none of the existing regimens for women is satisfactory and the Stranger feels justified in prescribing that much the same laws should apply to men and women. However, there is a curious exception with regard to the second main type of gymnastics, i.e. separate dancing classes are prescribed for boys and girls. But perhaps we should not attach any importance to this anomaly, since the Stranger is mainly interested in excluding from the education of the young citizens the dubious kind of dancing associated with comedy. He prescribes that the warlike dances called 'Pyrrhic', and the peaceful dances called 'Emmeleiai', should be consecrated to the gods and fixed for appropriate festivals, whereas the 'dirty dancing' associated with ancient comedy should be forbidden in Magnesia. Similarly, the tragic dancing and singing will be replaced by the sober and serious work of the *Laws* itself. In this way, Plato seems to have fulfilled a promise made in the *Republic* to provide an alternative to ancient tragedy and comedy, which were a central part of civic education in many Greek cities. This leads us to consider the laws on musical education.

II. *Music: Peace Games for the Soul*

Since the soul is metaphysically prior to the body, its nurture through music is more important than gymnastics which cultivates the body, even though I have discussed gymnastics first because of its temporal priority in the nurture of children.[4] Once again, it is | stressed that the games children play are [169]

[3] Aristotle's *Politics* is a rich source of information about the deleterious effect of Spartan women on the constitution, e.g. their love of wealth shifts it towards oligarchy.

[4] *Rep*. 401d claims that music is the most sovereign because rhythm and harmony find their way to the inmost soul and bring it grace, if rightly taught. So that reason and habit will

vital for the permanence of the enacted laws, and so they deserve careful attention from the lawgiver. From this perspective the crucial point is that children's games must be fixed according to a given standard of propriety, and afterwards never be allowed to change. The underlying assumption here is that change is almost always for the worst, especially if it is a departure from ancient custom, whose permanence and longevity reflects its almost divine character.[5] Hence the Stranger rejects (797c) as a false hero the cultural innovator who is always ready to introduce new-fangled ideas and to jettison the old norms. We know from independent sources (e.g. Aristophanes and Thucydides) that fourth-century Athens had eagerly adopted many cultural innovations during the so-called Sophistic Enlightenment. Within Plato's mind these innovations were also associated with democracy and with the many disasters which befell Athens, not the least being its defeat in the Peloponnesian War. In this light, perhaps we can understand better why the Stranger emphasises (797c–d) that nothing is more dangerous than change with respect to everything, and exhorts everyone to respect the old fixed laws of the ancestors by adhering to them and not changing them. The connection with children's games is established through the rather striking claim (798c) that children who innovate in their games will grow up differently from their fathers, and hence pursue a different mode of life that requires different laws. Since music involves imitations (μιμήματα) of either good or bad men, it makes all the difference in the world what models are going to be imitated by the children. This appears to be a fundamental educational truth that each culture and each generation must learn for itself through bitter experience. When faced with the problem of rapid cultural change, Plato adopted the dual strategy of trying to arrest what he saw as degenerative change, while promoting through education a regenerative return to the divine origins of human culture. Thus at 798d–e the Stranger adopts the putatively Egyptian stratagem for arresting change by consecrating all dancing and music to the gods, so that any subsequent change constitutes blasphemy or impiety. By way of metaphysical justification for this strategy, he claims that the immobility of the divine is prior to human decisions, which are based on rational calculation.[6]

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be in harmony, the young must be taught to love the beautiful and hate the ugly, even before they reach the use of reason.

[5] *Rep*. 381a states the general rule that whatever is in the best state by nature or art admits of the least alteration by something else. But, since God is in the best possible state, the divine abides always and simply in its own form.

[6] By way of pointed rejection of the Protagorean dictum that 'man is the measure of all things', Plato insists in an earlier passage (716c) that God is the measure of all things.

Proceeding with elaborate caution, the Stranger proposes (799e–800a) a set of rules for selecting from among the traditional hymns those which are fitting and proper, in so far as they contain auspicious speech (*euphêmia*) in the form of prayer to the appropriate gods, and that they never request any bad thing as if it were something good.[7] Given the powerful influence of habit, the Stranger insists that all music must be regulated in such a way that children are taught to love sober and orderly music, while learning to hate unregulated music as vulgar. He concedes that neither type of music is superior in pleasure but claims that regulated music is rationally superior because it makes people better, while the other type makes them worse. By way of justification for the legislation governing music, the Stranger explains (803a) that supervision of the right use of leisure is necessary because our character shapes our whole life, just as a keel shapes the whole boat. Paradoxically enough, games are an important part | of human leisure [170] because they reflect our status as playthings of the gods. Here Plato tries to reinterpret the older pessimistic Greek view that pervades tragic poetry, according to which vulnerable human beings are at the mercy of capricious gods.[8] Thus he argues that games should be given serious attention and that everyone should engage in the noble pastimes of singing and dancing, so as to win the favour of the gods and thereby gain protection from enemies. Furthermore, contrary to popular opinion, he claims that war itself is not a serious business, except when it is conducted for the sake of peace.

Of course, Plato is well aware that the life of leisure prescribed for citizens of Magnesia involves quite a few material preconditions, even though it is merely a second-best *polis* by comparison with the ideal *polis* of the *Republic*. For instance, it presupposes at least a modest supply of the basic necessities of life, which are to be supplied by slaves who perform all the farm work and practice all the manual crafts. All the citizens will eat their frugal meals at common messes—separate for men and for women—even though women and children are no longer held in common but belong to individual households. Just as in the *Republic*, Plato warns against the mistaken Greek views of the good life, which assume that it must involve the pleasures of the table and the bed. Instead, he emphasises that the kernel of the life of leisure

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[7] Jaeger (1944, III: 349n302) finds some striking parallels between Plato's proposal for a civic religion in Magnesia and the traditional calendar of the Catholic Church, as well as its prescriptions for posture, singing and movement at religious services.

[8] See *Laws* 644d–645b. This is consistent with the educational programme in *Republic* III of prescribing correct ways of speaking about the gods in order to counteract the scandalous way in which the poets speak about them; cf. 386d–392a.

consists in acting according to virtue, and not living like a fatted beast which is liable to be slaughtered by a leaner beast of prey. Just like the disciplined life of the athlete which is dedicated to physical excellence, so the life of leisure involves complete dedication to moral excellence. Furthermore, wakefulness rather than sleepiness is characteristic of such a life precisely because it is akin to the divine life of eternal watchfulness. On this basis the Stranger lays down some regulations about the amount of sleep appropriate for a gentleman of leisure, whose whole day should be filled with virtuous activity. In effect, the public and private activity of a free citizen should consume all his waking hours, so that he represents a paradigm of wakefulness that is almost divine. But for purposes of war, household management, and civic administration, the citizen also needs the art of calculation, so let us now examine the curriculum prescribed for it.

III. *Mathematics: Usefulness for All Civic Duties*

After his detailed and painstaking discussion of gymnastics and music, the Stranger briefly outlines three related mathematical disciplines as part of the basic curriculum designed for ordinary citizens of Magnesia. They are described in the following terms: (1) computation and the study of numbers; (2) measurement of lines, surfaces, and solids; (3) mutual relationships of moving heavenly bodies. For the sake of simplicity, let us assume that these correspond to what we would call basic arithmetic, elementary geometry, and simple astronomy. At *Laws* 818a the Athenian Stranger says that none of these subjects is to be studied in minute detail
[171] by the general public, though they should be studied in depth by a | chosen few who will presumably be members of the Nocturnal Council.[9] Such a restriction follows from the fact that for ordinary citizens the ultimate purpose of their basic mathematical education is to make them good citizens rather than accomplished mathematicians. However, the Stranger insists that ordinary citizens cannot avoid learning the basic necessities, since not even God will be at odds with necessity, as Simonides says.

The deliberate play on the word 'necessity' here, and the citation from the poet Simonides, both draw attention to an implicit distinction between human and divine necessity, as well as the suggestion that mathematics

[9] This is confirmed by *Laws* X and XII, which discuss the education of members of the Nocturnal Council, and by the pseudo-Platonic *Epinomis*, which sets out a curriculum for mathematics and astronomy.

provides a way of understanding divine necessity. This appears to be confirmed when the Athenian claims (818b–c) that some practical or theoretical knowledge is necessary for any divine being who wants to take charge of human affairs, as well as for any human ruler who wishes to rule in a godlike way. Plato here seems to be referring to his own ideal of divine imitation as an aspiration for every human ruler when he makes the Athenian insist that anyone who is ignorant of arithmetic, geometry and astronomy will fall short of the divine ideal of knowledge. This provides the rationale for the subsequent inquiry which addresses the following leading questions (818cd): Which parts of the mathematical disciplines should be studied and when? Which topics should be separate and which combined, and how should they be combined?

The explicit methodological strategy here adopted is to advance from preliminary lessons to more advanced studies, and this is described as the most natural and necessary procedure, which no god would ever fight against. Once again, Plato seems to be indicating that the study of mathematics in Magnesia will always remain subservient to the higher goal of educating good citizens, which is also promoted by a proper knowledge of the divine. In this respect one might usefully draw comparisons with the formal proofs for the existence of god in Book X, which are designed to combat impiety and to promote social solidarity. Rather surprisingly, the Athenian claims that the most dangerous thing for the city is not total ignorance of a subject like mathematics but rather undertaking studies in the wrong way. Presumably Plato has in mind a sophistic approach to knowledge which uses it for the wrong purposes, e.g. Hippias of Elis displayed his knowledge of mathematics for self-aggrandisement and monetary gain. At 747b–c the Stranger had already warned that the study of mathematics is fine, so long as one removes illiberality and love of money from the souls of those who are going to be competent in such studies. Otherwise one will create a capacity for mischief-making (*panourgia*), such as one finds among the Egyptians and Phoenicians, due to bad lawgivers or bad luck or some natural disaster.

So the Athenian prescribes that the free citizens of Magnesia must study the basic mathematical disciplines up to the same level as children in Egypt and in the same way. For instance, lessons in calculation should be designed as play, such as the dividing up of numbers of garlands among smaller or larger groups. The crucial point seems to be that learning basic arithmetic as an integral part of play will give the citizens a useful introduction to the art of marshalling troops, or leading and deploying an army, or even to running a household, with the result that they become more resourceful citizens. At 747b the Stranger had already explained that in household management,

in constitutions and in the arts, there is no part of education with so much
[172] power as the study of numbers. It awakens one who is sleepy | and unlearned, giving him ease of learning, memory and sharpness, thus making him surpass his own nature by divine art.

Similarly, the study of elementary geometry is designed to rescue the citizens from a deep-rooted ignorance about incommensurability that is both comic and shocking. It is rather puzzling that Plato should make a big fuss about this, given that incommensurability was a theoretical discovery with few practical implications for the application of geometry to everyday affairs.[10] One wonders why he makes the Athenian provide an elaborate introduction to the notion of incommensurability here, given that it has already been presented and discussed in detail both in the *Meno* and *Theaetetus*. By means of a series of leading questions, the Athenian establishes that Cleinias thinks that line, surface, and volume are all commensurable with each other, namely, that each length is expressible in terms of another length, one surface in terms of another surface, and one volume in terms of another volume. Without providing any formal proof or evidence, the Athenian assumes (819e–820a) that some of these cannot be expressed in terms of the other, either exactly or approximately. On this basis he bemoans the ignorance about incommensurability on the part of the ordinary Greeks as 'shameful' (αἰσχρόν) because it is one of the necessary things which every citizen should know. He also outlines some other topics in geometry where similar errors arise about the nature of commensurability and incommensurability.

The Athenian concludes that basic arithmetic and geometry should be taught to the young through play, in the hope that such learning will eventually improve the state of Magnesia. If such disciplines do not help, then they can be cancelled or 'redeemed' like pledges which depositors receive from bankers. One should notice here that mathematics is to be an established part of the curriculum of education which is designed to produce good citizens and a stable city. With regard to astronomy, the question is whether it should be taught to young people, given the traditional charge of impiety levelled against those who tried to give explanations for the supreme deity and the universe. But the Athenian rejects (821a) such a charge because

[10] The most plausible conjecture that I can think of (but without any textual evidence) is that Plato attaches importance to knowledge of incommensurability because its discovery was reputed to be due to a divine command, communicated through the Delphic Oracle, to double the size of an altar before a plague would depart from the city.

he believes that astronomy is noble and true, as well as being a blessing to society and pleasing to the divine, if it is studied properly and not in a mistaken (sophistic) way. For instance, he finds it misleading to use the term 'planets' for the Sun and Moon, as well as for the other heavenly bodies, as this reinforces the common view (echoed by Cleinias) that these bodies 'wander', just like the Morning and Evening Star. But the Athenian insists that, in order to avoid blasphemy, the young people of Magnesia must learn the truths about the heavenly bodies, and use reverent language in sacrifice and in offering prayers. Cleinias agrees on the importance of correcting errors about the heavenly bodies, and the Athenian offers (822a) to give a brief explanation of their true motions. Despite being called 'planets', the Sun and Moon and other heavenly bodies do not wander but perpetually describe just one fixed orbit, while they appear to be always changing. In addition, people have wrongly supposed the quickest body (Saturn) to be the slowest, which is just as if spectators at the Olympic games had thought that the fastest horse in the race was the slowest and vice versa, while composing a panegyric for the loser, thinking it was the winner.[11] Such | mistakes at Olympia would be [173] ridiculously funny, but not in the case of important theological matters, as it gives the gods no pleasure to hear mortals spreading false rumours about them. If the Stranger can prove he is right (e.g. by appeal to Eudoxus' theory) then all these astronomical topics should be studied by free citizens. But if no proof is forthcoming, the matter should be left alone. In other words, better total ignorance than error.

Conclusion: Limited Education of Citizens of Magnesia

Why is it that the education of the citizens of Magnesia in the *Laws* appears to be so limited by comparison with the guardians of Kallipolis in the *Republic*? In Book II of his *Politics*, Aristotle claims that they receive the very same education, and he should know. But our lingering suspicions about the

[11] Since there was no absolute standard for measurement (like the speed of light in modern physics), ancient astronomy depended heavily on 'internal measurement', which involves taking one whole motion as a standard (e.g. the circular motion of the fixed stars) and comparing the relative motions of all the other heavenly bodies to its motion. So most of the measurements had the character of 'faster and slower', and the whole motions being compared were frequently incommensurable in the sense of lacking a common unit of measure. Thus Eudoxus' general theory of proportion, which resolved the incommensurability problem in geometry, also had many applications in astronomy.

inferiority of the basic education given to the citizens of Magnesia probably rests on the fact that only one book of the *Laws* is explicitly devoted to education, while the *Republic* has at least three if not four books on education. Yet the imbalance is more apparent than real, because the *Republic* contains a detailed account of the education of philosopher rulers, whereas the *Laws* says very little that is directly relevant to this topic. Perhaps this is because the *Laws* is mainly concerned with the second-best city, which is all that is possible for the colonists of Magnesia, whereas the *Republic* is meant to produce an ideal city in words (*Laws* 739c–d). Therefore, if we compare the descriptions of the primary education of the guardians in Kallipolis and of the citizens of Magnesia, the differences are reduced to matters of emphasis and of direction. For instance, the education of the guardians in Kallipolis seems to be directed almost entirely towards defensive and offensive military activity, whereas the citizens of Magnesia are also being prepared for war so that they will ultimately enjoy a life of peace and leisure. But perhaps this is also an apparent difference resulting from the emphasis in the *Republic* on the military function of the guardians in the *polis*, since it can hardly be the case that they will wage war for the sake of war. In fact, Plato would agree that whoever did so would be savage and insane, because the whole point of waging war is to gain peace. Paradoxically, the citizens will attain their greatest glory not through the activity of war (as common opinion might hold) but in the peaceful activities of civic festivals. It is by nobly performing both warlike and peaceful dances, and by singing the sober songs prescribed for the particular festival that they imitate the divine most truly. Such imitation of the divine is for Plato the ultimate, though unattainable, goal of human life.

Introduction

In this paper I argue that Socrates' elenctic method of moral inquiry, combined with his famous 'intellectualist' view of virtue as knowledge, influenced Aristotle in both positive and negative ways. When distinguishing sharply between theoretical and practical sciences, I think that Aristotle is reacting against Socratic intellectualism as this is reflected, for instance, in the denial of the possibility of *akrasia* (ἀκρασία). Yet, I claim that, insofar as Aristotle accepts the aporetic method of inquiry for ethics, he can never completely escape the lure of such intellectualism. My claim is argued and illustrated with reference to Aristotle's discussion of *akrasia* in *EN* VII, 1–3 where he tries to preserve some elements of the Socratic position.

I. *The Aristotelian Distinction between Practical and Theoretical Sciences*

When Aristotle distinguishes between theoretical and practical sciences, he seems to reject Socratic intellectualism by saying (*EN* I, 3, 1094b12 ff.) that one should not expect the same precision from politics as from other philosophical sciences, since it discusses much-disputed topics like justice and the good. This statement also appears to reject any Platonic project for an exact science of the Good based on the model of mathematics.[1] Aristotle here insists that one must be content with conclusions which are true 'for the most part' (ὡς ἐπὶ τὸ πολύ), when dealing with a subject-matter that yields only plausible premises. With regard to precision, the educated person (πεπαιδευμένος), will not demand strict demonstrations from an orator any more than he will accept probable reasoning from a mathematician.

[1] It is possible that Aristotle became methodologically self-conscious, partly as a result of his experience of the debacle of Plato's lecture(s) on the Good; cf. *EE* I, 8, 1218a17 ff. Aristoxenus reports in *Harm. El.* II, 30, (Meib), that Plato talked about abstract mathematics to an outraged audience, many of whom expected to hear something useful or even relevant to human affairs.

[99] In this passage, however, Aristotle does *not say* that different methods of inquiry are to be pursued in different sciences but only that different levels of precision are to be expected.[2] Thus one might still argue that comparison in terms of precision presupposes similarity in the logical structures of the sciences in question. For instance, just as Aristotle reconstructed mathematical demonstrations in terms of his own syllogism, so he also analysed the probable reasoning of the rhetorician as a kind of syllogism (the enthymeme: cf. *Rhet*. I, 1). Against such rational reconstructions, however, one might argue that practitioners of these two disciplines seem to be consciously following quite different procedures.[3] Such an argument may be supported by Aristotle's own remarks (*EN* I, 8, 1142a12 ff.) about how young men can be fine mathematicians, though usually they are not suitable students for ethics and politics. One reason for this, as he explains in *EN* I, 3, is that they are inexperienced in human affairs (τῶν κατὰ τὸν βίον πράξεων), which provide both the subject-matter and the premises for these practical sciences. The right sort of experience involves a kind of moral habituation which makes 'the that' (τὸ ὅτι) as a first principle obvious to the student without him needing to seek 'the reason why' (τὸ διότι, *EN* I, 4, 1095b5–94).[4]

Another reason given for the unsuitability of the young for ethics and politics is that they are led by their emotions (πάθεσιν), and so it is pointless for them to listen to lectures on these subjects, since the goal (τέλος) of practical sciences is not knowledge (γνῶσις) but action (πρᾶξις, *EN* I, 3, 1095a6–7). It is important to note that the distinction here between practical

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[2] From *Met*. VI, 1 & XI, 7 it is clear that Aristotle always differentiates between the sciences in terms of their characteristic objects, and not in terms of their methodical procedures. It remains unclear however, whether or not differences in method follow from differences in subject-matter.

[3] The relationship between theory and practice seems to be quite different for theoretical sciences as distinct from practical sciences. For instance, the expert in geometry needs to have knowledge of a theoretical system, whereas the virtuous person does not really require theoretical knowledge of virtue. In this point there is a clear symmetry between the practical and theoretical sciences, even though I think Aristotle regarded the general knowledge of virtue acquired through moral habituation as being useful for practice and as being analogous to theoretical knowledge. I am grateful to Wolfgang Wieland for drawing my attention to the above asymmetry and its relevance to the problem of *akrasia*.

[4] Cf. *EN* 1142a18–21 for a parallel with the study of physics or metaphysics whose first principles are derived from experience, so that young people can only repeat them without any conviction of their truth. See also *EE* 1217a10 ff. where Aristotle says that one should judge separately the cause (αἰτία) and the demonstrated fact (τὸ δεικνύμενον) because in some cases one should not listen to logical arguments (λόγοι) but rather attend to the appropriate phenomena (φαινόμενα).

and theoretical sciences is connected by Aristotle with the phenomenon of *akrasia*.[5] This emerges clearly in the subsequent clarification:

> And it makes no difference whether they are young in years or immature in character: the defect is not a question of time, it is because their life and its various aims are guided by feeling; for to such persons their knowledge is of no use, any more than it is to the persons of defective self-restraint. But moral science may be of great value to those who guide their desires and actions by principle. (*EN* I, 3, 1095a7–12, trans. Rackham)

Here Aristotle seems to contradict what he says elsewhere (*EN* VI, 8, 1142a15–16) about time being necessary for acquiring practical experience. But the apparent contradiction disappears when we see that he is talking about the *right sort* of experience, which has not been acquired by an adult with a juvenile character (τὸ ἦθος νεαρός).

This is why he insists that good moral habits are a prerequisite for students of ethics (*EN* 1095b5–7). With many unsuitable students it is not their lack of experience but rather some defect of character which prevents them from benefitting by lectures on ethics. For instance if their whole life is lived according to non-rational feeling (κατὰ πάθος) then it is pointless for them to seek general | knowledge of the good, since the point of ethics is to perform [100] good actions. Here Aristotle draws a parallel with the akratic man because he is someone who apparently knows the right thing to do, yet fails to do it. The parallel illustrates the difference between theoretical and practical knowledge, and this distinction is reinforced by Aristotle's conclusion that the science of ethics is a great help (πολυωφελὲς) to those whose desires and actions are guided by principle (κατὰ λόγον). What this means in practical terms is best illustrated with reference to his analysis of the phenomenon of *akrasia*.

II. *Aristotle's Discussion of* Akrasia

Thus I think it is plausible to read Aristotle as criticising both Socrates and Plato for attaching too much importance to theoretical knowledge in the development of virtue.[6] Yet I hold that Aristotle still remains within the

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[5] Similarly, in *EN* I, 13, the distinction between intellectual and moral virtues is introduced in connection with the phenomenon of *akrasia* which is discussed in terms of a division between rational and non-rational parts of the soul.

[6] But one should keep in mind that it is Aristotle himself who introduces a sharp distinction between theoretical and practical sciences, since Plato tends to use ἐπιστήμη and φρόνησις interchangeably. This indiscriminate usage is also found in Aristotle's own *Eudemian*

Socratic-Platonic tradition of ethical thinking in as much as he acknowledges the dominance of cognitive rationality in virtuous action. More specifically, with respect to the discussion of *akrasia* in *EN* VII, I argue that his explanation of this moral phenomenon consciously retains a strand of Socratic intellectualism, i.e. the *endoxon* that incontinence is caused by some kind of cognitive failure (or ignorance). Finally, turning to the *Eudemian Ethics*, I claim that Aristotle's intellectualism shows itself in his method of inquiry, though we must distinguish between the sort of meta-ethical inquiry that he conducts in the *Ethics* and his analysis of moral deliberation under the rubric of a practical syllogism.

After an apparent[7] detour in *EN* VI through the intellectual virtues, Aristotle returns to moral virtue in Book VII where he treats *akrasia* as a faulty moral disposition (διάθεσις). Assuming the essence of virtue and vice to be already clear, he begins the narrower task of inquiring about the nature of *akrasia* (ἀκρασία) and its opposite, *enkrateia* (ἐγκράτεια), with an important methodological preamble:

> We must, as in all other cases, set the phenomena before us and, after first discussing the difficulties, go on to prove, if possible, the truth of all the reputable opinions about these affections or, failing this, of the greater number and the most authoritative; for if we both resolve the difficulties and leave the reputable opinions undisturbed, we shall have proved the case sufficiently.
>
> (*EN* VII, 1, 1145b3–7, trans. Ross/Urmson)

This is similar to Aristotle's description of his own dialectical method in *Metaphysics* III, though it is not clear why he thinks such an aporetic method is appropriate for ethical inquiry and, specifically, for a discussion of the nature of *akrasia*. Focusing on the specific question here, I claim that this method is particularly appropriate for an inquiry about *akrasia* because Socrates and his method of elenctic inquiry is closely associated with the topic, which was much discussed both within and outside the Academy.[8]

Ethics, 1215b2, 1216a11, 1216a37, and even in the *Nicomachean Ethics*, 1096b24, 1098b24, 1153a21, 1172b30, where he discusses the views of others.

[7] Although I cannot argue the point here, I think that *EN* VI is not really a detour, given that it discusses the concept of practical wisdom (φρόνησις), which is an intellectual virtue that is crucial for Aristotle's ethics, and that it elaborates on the distinction between practical and theoretical sciences, which is relevant to my topic. But here I do not assume anything about the relationship of the so-called 'common' books, besides what is warranted by the references in *EN* VII.

[8] Cf. *EE* II, 8, 1124a32–33. Indeed, it is clear that Plato's division of the soul in the *Republic* depends on the phenomenon of *akrasia*, and may even have been proposed as an explanation that Aristotle takes as the general background for his own attempt to provide a better account.

Although Aristotle's own aporetic method is much more elaborate, I think it is arguable that *elenchus* or | refutation through contradiction stands at its [101] core.

I want to argue my thesis by analysing how Aristotle proceeds methodologically in his inquiry at *EN* VII, 1–3, about the nature of *akrasia* and its relationship to knowledge. First (1145b8 ff.), he lists some of the reputable opinions (ἔνδοξα) about *akrasia*, and this stage of the inquiry is what he calls 'setting out the phenomena' (τιθέντας τὰ φαινόμενα). I think it also roughly corresponds with the first stage of a Socratic *elenchus* in which the interlocutor is asked to give his own genuine opinion about the topic at hand. Although the dialogical elements have been removed in Aristotle's aporetic method, its starting-point is very similar from a logical point of view. For instance, the second opinion listed by Aristotle may also be taken as a general definition of the enkratic man as one who abides by the results of his calculation, as distinct from the akratic man who abandons the conclusion he has reached (1145b11–13). Also it is generally held that the akratic man does things that he knows (εἰδὼς) to be evil, under the influence of passion (διὰ πάθος); whereas the enkratic man, knowing his desires to be evil, refuses to follow them because of the influence of reason (διὰ τὸν λόγον, 1145b13–15). These common claims (τὰ λεγόμενα) are rather typical of the sort of general definitions sought by Socrates through the differentiation of opposites.

Similarly, I think that the Socratic elenchus has many points in common with Aristotle's aporetic method in its second stage, which he usually describes as 'going through the difficulties' (διαπορῆσαι). Socrates used to bring his interlocutor into difficulties by showing that the collection of opinions to which he subscribed led to contradiction.[9] Once again, Aristotle's method is more impersonal insofar as the difficulties do not depend on one person holding the conflicting opinions. But it does depend upon the gathering of such opinions around a leading topic, almost as if the person in a Socratic conversation is replaced by a *topos*. This corresponds roughly to the point in a conversation when Socrates gathers together the series of admissions that he has elicited from his interlocutor. As a

[9] This also fits with Vlastos' description (1983) of what he calls 'standard elenchus', which involves gathering a collection of premises to which the interlocutor agrees and from which the conclusion is deduced that contradicts the initial thesis. Lee (1935: 123) claims that Aristotle borrowed much of his dialectical method of *endoxa* from Plato, but I suggest that one should look further back to Socrates.

result contradiction is generated and the interlocutor reduced to a state of puzzlement (ἀπορία). After this genuine point of intersection, however, the Socratic and Aristotelian methods of inquiry begin to diverge because Aristotle sets himself the task of resolving puzzles by preserving the truth of the most authoritative common opinions. By contrast, the historical Socrates saw the occurrence of aporia as symptomatic of human ignorance, and so he does not seem to have envisaged a positive search for truth in common opinions.[10]

From this perspective it is appropriate that in producing his first difficulty (ἀπορία) Aristotle should appeal (1145b22 ff.) to the reputable opinion of Socrates that a man cannot act akratically while knowing his act to be wrong, because it would be 'strange' (δεινόν)[11] if knowledge should be so overpowered (κρατεῖν) and 'dragged around like a slave' (περιέλκειν … ὥσπερ ἀνδράποδον). This loose quotation from Plato's *Protagoras* (352b) suggests that Aristotle used it as a source for his philosophical understanding of the Socratic position on *akrasia*. However, he also seems to refer to the historical Socrates[12] as
[102] one | who used to fight (ἐμάχετο) against the view that there is such a thing as *akrasia* by arguing that no one knowingly acts contrary to what is best because such a thing is possible only through ignorance (δι' ἄγνοιαν).[13] Having

[10] Gadamer (1986a: 22) has pointed out that Xenophon's apologetic works tend to suggest that Socrates appeared to his contemporaries to have a purely negative purpose in his inquiry. By contrast, Vlastos (1983) has argued that the Socratic elenchus must be assumed to establish the truth of some opinions, i.e. some premises that lead to the contradiction must be reasonable in themselves and accepted as true. But Vlastos' argument is based on logical (and textual) inference rather than on historical evidence, and the critical picture of Socrates in the *Cleitophon* dialogue (whether Platonic or not) seems to tell against it.

[11] We know from the chorus of Sophocles' *Antigone*, that the word δεινόν is ambiguous in that it can mean 'terrible' or 'dreadful' as well as 'wonderful' and 'strange', though I have chosen the latter here as the more neutral philosophical meaning. Perhaps we should also keep the poetic sense in mind, however, because it would be quite in keeping with Socrates' moral rejection of the possibility of *akrasia* as a disgraceful suggestion.

[12] It is an open question (which I do not address here) just how much Aristotle knew about the historical Socrates independently of Plato and the Academic tradition. Yet I find it reasonable to assume that he would have given precedence to this Platonic tradition, although he may also have consulted some of the apologetic treatises that had been promulgated by other members of the Socratic circle.

[13] Dihle (1982: 33) has shown how the Socratic maxim that 'no one fails on purpose' (οὐδεὶς ἑκὼν ἁμαρτάνει) was deeply rooted in previous Greek ethical thinking, according to which moral accomplishment depends entirely on intellectual performance. I think this suggests that the historical Socrates held that thinking and acting are so closely connected that for him wrong action was synonymous with a failure in thinking (i.e. ignorance). If this is the case then Aristotle has distorted the picture somewhat by distinguishing theoretical from practical wisdom so as to combat Socratic intellectualism.

briefly outlined the Socratic argument (λόγος), Aristotle claims (1145b27–28) that it clearly conflicts (ἀμφισβητεῖ) with the appearances (τοῖς φαινομένοις). Some people[14] have taken him to be dismissing the Socratic view completely on the grounds that it goes against the 'plain facts', but I think that at this stage of his aporetic inquiry Aristotle is merely noting the conflict between such a reputable opinion and one of the common statements (τὰ λεγόμενα) already outlined about the akratic man, namely, that he does things which he knows to be evil under the influence of passion. It is with such 'appearances' that the Socratic view conflicts, thereby creating an aporia which Aristotle seeks to resolve through his dialectical inquiry.

I think we can see him taking the Socratic position seriously when he says (1145b29–30) that, if *akrasia* is caused by ignorance, one must examine what is the manner of this ignorance.[15] Although this statement has a conditional structure, Aristotle later (1146b31 ff.) tries to find a grain of truth in the Socratic view by making distinctions between different kinds of knowledge and ignorance. Without such qualifications the view appears paradoxical, since it is obvious (φανερόν) that the akratic man does not think his action right *before* (πρίν) he comes under the influence of passion.[16] Here we find one of those well-established appearances which Socrates seems to have overlooked in rejecting the possibility of *akrasia*. An attempt to defend this paradoxical position is found in a modified 'Socratic' view which holds that nothing is more powerful than knowledge (ἐπιστήμη), but that the akratic man merely acts contrary to his opinion (δόξα) of the better course of action. Although in his own account of *akrasia* Aristotle rejects this compromise, it shows one way of resolving the paradox by means of such distinctions.

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[14] Cf. Martha Nussbaum (1986), who has been sharply criticised by John Cooper (1988a) on this point.

[15] Since *akrasia* is here characterised as a πάθος and connected in some way with ignorance, we might wonder whether ignorance is also assumed to be a πάθος. But, if ignorance is a privation of knowledge, and knowledge is a ἕξις, then the relevant ignorance in the case of *akrasia* is the temporary absence of an appropriate kind of intellectual and moral ἕξις, which was described as prudence (φρόνησις) in *EN* VI and defined as a truth-attaining rational quality, concerned with action, in relation to the things that are good for human beings (ὥστ' ἀνάγκη τὴν φρόνησιν ἕξιν εἶναι μετὰ λόγου ἀληθῆ, περὶ τὰ ἀνθρώπινα ἀγαθὰ πρακτικήν. *EN* 1140, 20–22).

[16] In order to reconcile some of Aristotle's apparently conflicting claims about *akrasia*, Terence Irwin (1988) attributes to him the view that it is due to faulty deliberation, which reaches a bad conclusion to a practical syllogism under the influence of non-rational desire (cf. *EE* VIII, 1). By contrast, the *phronimos* deliberates well in that he reaches a good conclusion, influenced by rational desire for what is objectively good. Although the enkratic man reaches a similar good conclusion, he has greater difficulty in overcoming non-rational desire because he attaches too much value to what is only apparently good.

In moving towards his own solution, Aristotle proceeds aporetically by raising objections against most of the opinions about *akrasia* which were listed at the beginning of his inquiry. For instance, he resists the opinion that the enkratic and the temperate man are identical, since the latter does not have the excessive desires that necessarily belong to the former, who becomes continent precisely by controlling them (1146a10 ff.). In order to deepen the puzzle, he even adds one or two sophistic objections which argue that *enkrateia* may be bad because it makes one persist in a false opinion, while *akrasia* combined with foolishness may give rise to good actions. These sophistic puzzles have little interest in themselves, but they throw some light on Aristotle's own aporetic method:

> The sophists wish to show their cleverness by entrapping their adversary into a paradox, and when they are successful, the resultant chain of reasoning ends in a deadlock. The mind is fettered, being unwilling to stand still because it
> [103] cannot approve the conclusion | reached, yet unable to go forward because it cannot untie the knot of the argument.
>
> (*EN* VII, 2, 1146a22–27, trans. Rackham)

Given his derogatory remarks about sophistic cleverness, one might think that Aristotle also rejects their elenctic method, but I hold that this would be a mistaken inference.

The above methodological description corresponds closely with that found in *Metaphysics* III, 1, especially in the characterisation of aporia as an intellectual bind generated by the paradoxical conclusion of an elenctic argument which, though unacceptable, one cannot rebut because one is unable to untie the knot in the argument. Since exactly the same metaphors of binding and loosing are used in both passages, I claim that here we find an accurate account of the initial stages of Aristotle's aporetic method of inquiry, which itself is clearly based on elenctic refutation. The crucial difference between this and the sophistic approach lies in the underlying moral purpose (προαίρεσις βίου), as he himself says in the *Rhetoric* (I, 1, 1355b18–19). Whereas the sophists generate a paradoxical conclusion to establish their own cleverness (ἵνα δεινοὶ ὦσιν)[17] by befuddling their opponents, Aristotle sees the resulting puzzlement as a stimulus to further inquiry, whose ultimate goal

[17] Since the same ambiguous Sophoclean term is used here with reference to the sophists, perhaps Aristotle has in mind also their attempt to inspire dread through their eristic power, just as a travelling magician might terrify a credulous audience with a display of his secret tricks. This would fit with the charge of wizardry which many Athenians levelled at Socrates because of the spell-binding character of his elenchus (cf. Plato's *Meno*).

is that of resolving the puzzle. For Aristotle, therefore, the aporetic method has the serious purpose of solving philosophical problems, which themselves are brought into focus through the practice of outlining competing opinions and of bringing forward difficulties. This purpose is grounded in the natural human desire to know, which is stimulated especially through puzzles.[18]

I find some confirmation for my thesis in a brief methodological remark which Aristotle makes at the conclusion of the purely aporetic part of his inquiry about *akrasia*:

> Such, more or less, are the difficulties that arise. Part of the conflicting opinions we have to clear out of the way, but part to leave standing: for to solve a difficulty is to find the answer to a problem. (*EN* VI1, 2, 1146b6–8, trans. Rackham)

These remarks draw our attention to two different aspects of Aristotle's conception of his method of inquiry. First, there is the strictly aporetic stage which he has now completed in a full listing of the difficulties associated with *akrasia*. Second, we have a very brief description of how Aristotle intends to proceed in the resolvent stage of the inquiry, namely, to dismiss (ἀνελεῖν) some of the conflicting opinions, while leaving behind (καταλιπεῖν) those which stand up to scrutiny. The rationale for this procedure is that the resolution of a puzzle is the discovery of a solution (ἡ γὰρ λύσις τῆς ἀπορίας εὕρεσίς ἐστιν. Cf. also *EE* 1215a6–8). What Aristotle seems to mean here is that to solve the problem about the nature of *akrasia*, for instance, one must find a way out of the difficulties associated with it by rejecting what is false and retaining what is true in the collection of conflicting opinions. But this suggests that he has in mind some | unspecified criterion of truth which can be used in examining [104] these opinions. Given the nature of aporetic inquiry, the best candidates for such a criterion[19] are either *consensus omnium* or consistency between the reputable opinions (cf. *EN* X, 2, *EE* I, 6).

As a result of his review of difficulties, Aristotle sets out the leading questions which guide the subsequent resolvent stage of his inquiry:

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[18] In *Rhet*. I, 1 Aristotle says that men have a sufficient natural capacity for the truth (πρὸς τὸ ἀληθές πεφύκασιν ἱκανῶς) and that in most cases they attain it. His general claim is that both truth and verisimilitude come under the purview of the same faculty (δύναμις), so that one who recognises truth will also recognise probabilities (τὰ ἔνδοξα). This claim indirectly supports my claim about the residual intellectualism in Aristotle's approach to ethics, especially at the second-level order of inquiry.

[19] See Vlastos 1983 and Scaltsas 1989 on the relevant criterion of truth for Socratic elenchus. See also Oehler 1961 for a review of the role of *consensus omnium* as a criterion of truth in the ancient world.

1) Whether or not one who acts akratically knows what he does is wrong: and, if he knows, in what way does he know? 2) What should one posit as the objects with which *enkrateia* and *akrasia* are concerned, i.e. whether they are concerned with pleasures and pains of all sorts or only with certain definite kinds? 3) Whether or not the enkratic man (τὸν ἐγκρατῆ) is the same as one who is steadfast (τὸν καρτερικόν). It is noteworthy that most of these questions share the classic 'either/or' structure associated with aporetic inquiry, and that they also serve to determine the subsequent path of Aristotle's inquiry about *akrasia*. In fact, he characterises as a 'starting-point of inquiry' (ἀρχὴ τῆς σκέψεως) the question of whether the differentia (διαφορά) of enkratic from akratic men is constituted by their objects (τῷ περὶ ἃ) or by their dispositions (τῷ πῶς ἔχοντες. See 1146b14–16). This aporetic question is immediately clarified in terms of the following alternatives: whether a man is called akratic solely because of the things with reference to which (τῷ περὶ ταδὶ) he fails in restraint or because he is so disposed (τῷ ὥς) or on both grounds. A second and related leading question for the inquiry is whether or not *enkrateia* and *akrasia* can be displayed in regard to every sort of object. All of these questions demand some account of the essential nature of *akrasia* as a moral disposition (διάθεσις) which will differentiate it not only from *enkrateia* but also from similar states of character (ἤθη) such as profligacy (ἀκολασία). Since the profligate and the akratic man both are defined with reference to the same kind of objects, they can be distinguished only by means of their respective dispositions towards these objects. Whereas the profligate man is willingly (προαιρούμενος) led by his appetites, since he considers that he ought always pursue the pleasure which is present, the akratic man by contrast does not share this belief, even though he pursues the pleasure just the same.

With reference to the first leading question and the Socratic direction which it has given the inquiry, Aristotle now completes his projected task of preserving the truth in the common opinions about *akrasia*. With respect to the distinction between knowledge and true opinion which grounded the modified 'Socratic' position, Aristotle says that it makes no difference to his account of *akrasia* because a man can be just as firmly convinced of opinions as of knowledge, yet still act against his conception of what is right. By contrast, he thinks it important to distinguish the man who has knowledge without exercising it from the man who is actually exercising it because it will make a great difference for the account of *akrasia* whether a man has knowledge in the first or the second sense. It will seem strange (δεινόν) if a man does wrong, while actually exercising the knowledge that his action is wrong, whereas it will not seem surprising if he is not contemplating

(θεωρῶν) it at the time (1146b35–36). The use of δεινόν | here suggests that [105]
this distinction is important for Aristotle's solution to the Socratic paradox about *akrasia*.[20]

Another important distinction depends on Aristotle's own analysis of moral reasoning in terms of the practical syllogism, according to which the major premise is universal while the minor is particular. Since practical action always deals with particular things, it is possible for a man to act against his knowledge when he knows both premises but is only exercising knowledge of the universal and not of the particular premise.[21] For example a man may know in the actual sense that food of a certain kind is good for every man, yet not know in either sense that what stands before him is food of this particular kind. After introducing this distinction between types of knowledge, Aristotle emphasises (1147a8–10) that it will make a great difference to the account of *akrasia* because, whereas it will not seem at all absurd (ἄτοπον) that the akratic man should 'know' in one way, it would be astonishing (θαυμαστόν) if he 'knew' in the other sense. At this point in his inquiry, I think it is clear that he intends to resolve the Socratic puzzle about *akrasia* by distinguishing between various senses of knowledge.

But the most important distinction for Aristotle's solution is that between different senses of having knowledge without exercising it. Here the examples of sleep, madness, and drunkenness illustrate how a man can be said both to have knowledge in one sense and not to have it in another. Thus, for instance, a drunken man may repeat the moral maxims of Empedocles without really having knowledge of them. Such examples also illustrate the state of persons under the influence of passion because for Aristotle it is obvious that non-rational passions like anger and sexual desire alter the state of the body. Thus he concludes (1147a17–18) that, while he is acting akratically, the akratic man has knowledge only in the same way as men who are asleep or drunk or even mad. Just as in these cases, the fact that the akratic man can speak about the right action is no evidence that he actually possesses knowledge of it. He is just like an actor speaking a part or someone talking in his sleep. His situation is also compared to that of a beginner who has learned by heart

[20] Another aspect of Aristotle's intellectualism in ethics is his tacit acceptance of the Socratic view that it would be dreadful (δεινὸν) if the rational intellect were completely powerless in face of the passions.

[21] See *EN* VI, 8, 1142a21–23 where Aristotle says that in deliberating (βουλεύσασθαι) there is a double possibility of error, since one may go wrong in respect to either the universal (τὸ καθόλου) or the particular (τὸ καθ' ἕκαστον), e.g. either in assuming that all heavy water is unhealthy or in taking this particular (τοδὶ) water to be heavy.

some formula in a subject without knowing its meaning within the whole system.[22] Aristotle's explanation of this cognitive failure is that the acquisition of exercisable knowledge takes time because it must become 'second nature' (συμφυῆναι), as it were. There is a similarity here between the acquisition of practical and theoretical knowledge which may be expressed by saying that both require habituation.[23]

Under the rubric of a 'physical' (φυσικῶς) inquiry into the cause (αἰτία) of *akrasia*, Aristotle adopts (1147a24 ff.) a different approach through an analysis of the practical syllogism. Now this characterisation is rather surprising, given that such an analysis could be better described as 'logical' (λογικῶς) by way of contrast with a 'physical' inquiry which might appeal to psychological explanations.[24] Later, in fact, Aristotle does give a psychological account of *akrasia*, though he first appeals to the practical syllogism in order to outline the structure of intentional action in which this moral phenomenon occurs. Thus, in a practical syllogism, the major premise is a universal opinion (e.g.
[106] All sweet things | ought to be tasted), whereas the minor premise is about particular things (e.g. This thing here is sweet) which are grasped through sense perception. Strangely enough (in view of the inexactitude in practical affairs), Aristotle insists that the same necessity holds in practical as in theoretical syllogisms; except that one does (πράττειν) the appropriate action which follows from the two premises (i.e. tasting this thing), unless one is prevented by other circumstances. Within these terms of reference, he now tries to give an intelligible account of how the akratic man can do the wrong action, while knowing the right thing to do.

Aristotle's explanation involves positing two universal judgments as being simultaneously in the mind, though only one of them issues in action

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[22] Perhaps there is a parallel here with youths who repeat the principles of metaphysics or of physics without understanding, since they do not have the right sort of experience (cf. *EN* VI, 8, 1142a20–21).

[23] See Burnyeat 1981 for an analysis of Aristotle's account of the acquisition of theoretical first principles in terms of intellectual habituation. Irwin (1988: 82) also accepts the analogy between the acquisition of theoretical and moral knowledge, even though he stresses that the distorting effect of character flaws is greater for moral judgment because it is influenced by pleasures that produce such flaws.

[24] Charlton (1989) takes φυσικῶς here to indicate that, as distinct from a more general (λογικῶς) inquiry, Aristotle is embarking on a special scientific inquiry into the nature of *akrasia* within the specific context of intentional human action. While there are some textual parallels for such a contrast (*EE* 1211b17–24), it would mean in this case that the review of opinions about *akrasia* does not belong to a stricter scientific inquiry about it. But such an implication is hard to reconcile with the dialectical manner in which Aristotle actually proceeds in *EN* VII, 1–3. It would fit better with this procedure to include both a more general 'logical' approach and a particular 'physical' inquiry about *akrasia*.

because appetite (ἐπιθυμία) renders active (ἐνεργεῖ) the appropriate particular judgment. For instance, a universal prohibition against tasting sweet things may exist in the mind at the same time as a universal belief that all sweet things are pleasant. The decisive factor for action, however, is the activation of the particular judgment falling under these general judgments. Thus between 'This thing is to be avoided', for instance, and 'This thing is sweet', the choice for action is made by appetite because, as Aristotle explains (1147a35–36), it is capable of moving the relevant parts of the body. We can now see why he characterised his account as 'physical', since his appeal to desire as the moving cause of practical action depends on his psychological and physiological theories about the motion of the human soul. Evidence that this is the proper context for his account is to be found subsequently (1147b4–6) when Aristotle explains that the lower animals cannot be called akratic because they do not have beliefs about universals but only images and memories of particulars. Thus it is crucial for his account of akratic men that there is some sense in which they act under the influence of opinion (δόξα), though it is only accidentally opposed to the right principle of action. For Aristotle, the true source of *akrasia* is non-rational appetite (ἐπιθυμία), as it is essentially opposed to the right principle which is rational desire (βούλησις).

With this fundamental insight he begins the task of 'saving the phenomena', which makes his aporetic method of inquiry superior to that of Socrates. For instance, the Socratic account of *akrasia* cannot answer the question of how the ignorance (ἄγνοια) of the akratic man is dissolved when he returns to a state of knowledge. By contrast, drawing on his own psychological theories, Aristotle explains (1147b6–9) that the cognitive capacity of the akratic man ceases to be impaired by passion in the same way as drunkenness wears off or as one wakes from sleep. As I have suggested already, this psychological theory about the influence of non-rational passions upon cognitive judgments is clarified in terms of the practical syllogism whose particular premise governs right action, since it is a correct opinion about some object of sense.[25] According to Aristotle's explanation of *akrasia*, therefore, it is such right

[25] This is what Aristotle means in his account of good choice in terms of right desire which pursues the same things as the correct principle dictates (*EN* 1139a26–32). Such is what he calls correct deliberation in the strict sense of achieving something good, by comparison with the analogous deliberation both of akratic and of bad men who calculate about the 'right' thing to do and then do it, but gain something evil (*EN* 1142b16–23). This later passage provides some evidence that Aristotle thinks of the akratic as acting in conformity with a complete and 'correct' practical syllogism, so his 'ignorance' must consist in a failure to perceive the true nature of the particular object or situation that supplies the minor premise.

opinion about particulars which is affected by non-rational passion in the akratic man with the result that either he does not possess it or his possessing (ἔχειν) it does not amount to knowing (ἐπίστασθαι) it (1147b9–12). In view
[107] of the psychological background, he can compare | the state of the akratic with that of a drunken man who repeats the moral maxims of Empedocles without any practical understanding of them.[26]

Similarly, by appealing to another aspect of his practical syllogism, Aristotle can also save the grain of truth which he finds in the paradoxical Socratic denial of *akrasia*. The important point here is that the correct particular premise, whose practical effectiveness is undermined by the passions, is not an object of knowledge (ἐπιστημονικόν) in the same way as the universal premise. Thus there is some truth in Socrates' claim that one who *really* knows the right thing to do cannot do wrong. As Aristotle says also in the *Posterior Analytics*, knowledge in its true sense (κυρίως) is thought to be universal, but such knowledge is not overcome when *akrasia* occurs. Therefore, it is not true knowledge which is 'dragged about by passion' (περιέλκεται διὰ τὸ πάθος) but rather knowledge of perceptible particulars.[27] Aristotle's loose quotation from the *Protagoras* is obviously designed to show that he is giving due weight to the Socratic position as it is there recorded by Plato. With these remarks he concludes his treatment of the question of whether or not *akrasia* is compatible with knowledge in any sense.

III. *Aristotle's Residual Intellectualism*

Finally, using a passage from *Eudemian Ethics* I, 5, I want to review my initial claim that Aristotle retains something of Socratic intellectualism in his own solution to the problem of *akrasia*. The chapter first discusses three different modes of life that are chosen because they are thought to constitute

[26] David Charles (1984) attributes to Aristotle what he describes as a 'moderate desire-based account' of *akrasia* which differs from a pure intellectualist account in that it posits a tension between evaluation and motivation that comes to light in akratic action. This is seen as a compromise view which treats *akrasia* as a failure of practical reasoning, rather than of theoretical reasoning involving only beliefs.

[27] In a revealing passage from the *Rhetoric* I, 1, 1354b3 ff., Aristotle distinguishes between the judgment of the legislator, which is universal and applies to the future, and the judgment of a member of the assembly or of a juror, who both deal with immediate and particular questions. In the latter cases, he says, love or hate is often involved so that they are no longer able to discern the truth adequately (θεωρεῖν ἱκανῶς τὸ ἀληθές). The parallel with *akrasia* is clear from Aristotle's diagnosis to the effect that their judgment is obscured (ἐπισκοτεῖν τῇ κρίσει) by their own pleasure or pain.

happiness (εὐδαιμονία), i.e. the political, the philosophical, and the life of enjoyment. Then Aristotle proposes to examine the nature of virtue (ἀρετή) and of practical wisdom (φρόνησις) because they are thought to be connected with happiness, not by the majority but by those people who are worthy of notice (ἄξιοι). This selectiveness is consistent with the methodological distinction which he makes elsewhere between the worthless opinions of the many and the reputable opinions (ἔνδοξα) of the wise (cf. *EN* 1095b19, *EE* 1214b28). For my argument in this paper it is important to note that it is the second kind of opinion which is ascribed to Socrates in the subsequent passage:

> Accordingly Socrates the senior thought that the End is to get to know virtue, and he pursued an inquiry into the nature of justice and courage and each of the divisions of virtue. And this was a reasonable procedure, since he thought that all the virtues are forms of knowledge, so that knowing justice and being just must go together, for as soon as we have learnt geometry and architecture, we are architects and geometricians; owing to which he used to inquire what virtue is, but not how and from what sources it is produced.
>
> (*EE* I, 5, 1216b3–11, trans. Rackham)

Here we find one of Aristotle's clearest expositions of Socratic intellectualism, | combined with indications of how his own approach to ethics differs [108] from that of Socrates. If my thesis can be saved from the counter-evidence in this passage then perhaps it is sufficiently proved, as Aristotle himself might say.

Let us consider, first, how Aristotle reconstructs the motivation for the Socratic view, which he treats as an opinion worthy of consideration. Assuming that the goal (τέλος) of ethics was to obtain knowledge (τὸ γινώσκειν) of virtue, Socrates inquired about the essence (τί ἐστιν) of each of the virtues. Given such an assumption, Aristotle finds this method to be 'reasonable' (εὐλόγως) because if all the virtues are forms of knowledge then one can become virtuous simply by acquiring knowledge of the appropriate virtue. While it is clear that he himself is critical of this intellectualist assumption, I want to claim that he does not reject it entirely, even in this apparently clear-cut passage. We should notice that he does *not say* that the Socratic approach to ethics is completely mistaken but rather that it is misdirected in concentrating exclusively on knowledge of essence, while neglecting questions about how (πῶς) and from what sources (ἐκ τίνων) virtue is produced. According to Aristotle, what Socrates neglects is the relation of each virtue to the appropriate passions, which provide both the ground and the way to a fixed disposition through proper habituation. As the phenomenon of *akrasia* shows, the most important thing for acting virtuously

is not universal knowledge but rather the correct recognition of particulars that is either promoted or undermined by desire, depending on whether good or bad habits have been formed. In other words, the point of ethics is to do the right thing rather than to know the right thing to do, even though such knowledge is also necessary.

I think that this is exactly the point which lies behind Aristotle's subsequent distinction between the theoretical and practical sciences in terms of their primary goals. As we can see from the previous passage, he thinks that Socrates had failed to make this distinction when he extrapolated from geometry to the knowledge of virtue.[28] By contrast with practical knowledge, Aristotle insists (1216b11–15) that theoretical sciences such as astronomy, physics, and geometry, have no other purpose (τέλος) except knowing (τὸ γνωρίσαι) and contemplating (θεωρῆσαι) the nature (φύσις) of its objects of study. Almost as an afterthought, Aristotle concedes (1216b15–17) that such knowledge may happen (κατὰ συμβεβηκός) to be useful for our basic necessities, presumably either in the practical or productive sphere. In spite of being a parenthetical remark, I think that this concession is important because it shows how theoretical knowledge can have a real effect in practical or productive matters, even though this effect has no integral connection with its primary goal of attaining knowledge of essences. By contrast, the purpose of a practical or productive science is quite different from that of a theoretical science. For instance, the goal of medicine is to produce health, while that of politics is to bring about good order (εὐνομία) in the city.

But it is important for my argument that Aristotle concedes that theoretical knowledge can also make a contribution to such practical and productive goals:

[109] Although, therefore, it is fine even to attain a knowledge of the various fine things, all the same, nevertheless, in the case of goodness it is not the knowledge of its essential nature that is most valuable but the ascertainment of the sources that produce it. For our aim is not to know what courage is but to be courageous, not to know what justice is but to be just, in the same way as we want to be healthy rather than to ascertain what health is, and to be in good condition of body rather than to ascertain what good bodily condition is.

(*EE* I, 5, 1216b19–25, trans. Rackham)

[28] This diagnosis of Aristotle's is rather strange, given that the historical Socrates (so far as we know) never concerned himself with mathematics, except as another example of *technê*. Perhaps we can take it as an implicit admission that Socrates did not distinguish theoretical and practical knowledge because for him φρόνησις means that correct thinking shows itself in correct action.

Perhaps the importance of the concessive μὲν is reduced somewhat by the almost tautological connection between the value (καλόν) of theoretical knowledge when it is of valuable things (τῶν καλῶν). In spite of this ambiguity, however, I think that the valuable things in question are the virtues and that Aristotle is conceding the practical worth of knowing their essences.[29] This is confirmed by the subsequent claim that the most valuable (τιμιώτατον) knowledge about virtue is not of this sort, but is rather knowledge of its sources (ἐκ τίνων). In spite of its anti-Socratic appearance, Aristotle's claim here also implies that the definition of virtues has some value for ethical inquiry, though it is subordinate to the discovery of how and from what sources these virtues come to be. Such ordering of priorities is determined by his conception of action as the goal of practical, by contrast with theoretical, sciences. Incidentally, this ordering also corresponds with Aristotle's own methodical procedure in *Nicomachean Ethics* II–III, where he begins with a discussion of the appropriate passions for each virtue before proceeding to define its essence. Of course, this second-order inquiry appears to be somewhat removed from practical action, and it does not seem that the moral agent need engage in such an inquiry so as to become virtuous.

Therefore, let me conclude by examining a passage where Aristotle differentiates his view from that of Socrates with respect to the role of knowledge in ethical action. This occurs in *Nicomachean Ethics* VI, 13 within the context of his reconsideration of the nature of virtue (ἀρετή). Behind the discussion we can glimpse the old question of Plato's *Meno* about whether virtue can be taught or whether it comes by nature or in some other way. By contrast with Socrates and Plato, Aristotle accepts the general consensus that there is such a thing as natural virtue, i.e. that we are born with dispositions conducive to making us temperate or brave. But he distinguishes such natural (φύσει) virtue from virtue in the strict sense (κυρίως), drawing an analogy with the difference between prudence (φρόνησις) and cleverness (δεινότης, cf. 1144b1 ff.). In the previous chapter (VI, 12, 1144a23 ff.), Aristotle

[29] See *EN* VI, 7, 1146b15–16 where Aristotle says that prudence is not only (μόνον) a knowledge of general principles but must also take account of particulars, since it is concerned with action, which always has to do with particulars; cf. also *EN* 1141b22–23 & *EE* I, 5, 1216b35–39, where Aristotle concedes that the study of essences and causes is necessary for politics, and especially for the legislative aspect of it. At *EN* X, 1, 1172b3 he also says that true theories are the most valuable for conduct as well as for science because they harmonise with the facts and carry conviction, thereby encouraging those who understand them to guide their lives by them.

has described cleverness as a faculty for choosing the appropriate means to a given end, whether this be good or evil. For him cleverness is analogous
[110] to natural virtue in that both are morally neutral until | they are oriented to some purpose which then determines their moral worth. Thus cleverness in attaining some worthy goal can amount to prudence when it reflects a fixed disposition, just as natural virtue can become true virtue when it is informed by intelligence (νοῦς). The analogy is completed by the fact that, just as true virtue presupposes natural virtue while perfecting it, so also prudence requires cleverness even while giving it moral value through worthwhile goals.

In light of the preeminent position given to prudence in his own analysis, Aristotle can now (1144b17 ff.) allow some truth to the Socratic view that all virtues are forms of prudence. Although he holds this universal claim to be mistaken, Aristotle thinks that Socrates was right in saying (καλῶς ἔλεγεν) that the virtues cannot exist without prudence. As proof (σημεῖον) of his correctness, Aristotle adduces (1144b21 ff.) the general agreement in contemporary definitions of virtue about it being a kind of disposition which is determined by the right principle (κατὰ τὸν ὀρθὸν λόγον), which itself is ascertained by prudence. For him what this agreement reflects is the ability of every thinker to grasp something of the nature of virtue as a disposition in accordance with prudence (κατὰ τὴν φρόνησιν).[30] But he suggests that, in order to capture the precise essence of virtue, an important modification must be made in previous formulations. It is not merely a disposition conforming to right principle but it is also achieved by means of the right principle (μετὰ τοῦ ὀρθοῦ λόγου), which is furnished by prudence.[31] Whereas Socrates thought that the virtues are identical with rational principles (λόγους), since he viewed them as forms of knowledge, Aristotle holds that the virtues exist through the principle (μετὰ λόγου). As it is represented here, the Socratic view is that virtue consists in the (external) control of the passions by right reason, whereas the Aristotelian view emphasises the constitutive role of practical reason in right desire.

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[30] With regard to the question raised earlier, these statements suggest that for Aristotle's ethical inquiry the predominant criterion of truth is that of *consensus omnium* rather than logical consistency.

[31] At *EN* VI, 5, 1140b28, Aristotle insists that prudence is not just a rational disposition (ἕξις μετὰ λόγου), since such a disposition can be forgotten, whereas such is not the case for prudence or the moral virtues; cf. also *EN* I, 10, 1100b12 ff.

Conclusion

I have tried to show that, despite his apparent rejection of Socratic intellectualism in ethics, Aristotle retains something of that view by holding that virtue involves the rational persuasion of some appropriate passions. When such persuasion fails, as in the case of *akrasia*, it is analysed by him as a type of cognitive failure caused by disruptive passions. Using the practical syllogism to analyse this failure, however, Aristotle concedes that it is not knowledge of the universal but rather of the particular which is mastered by the passions. But this concession to Socratic intellectualism appears to be minimal because, from the practical point of view, it is the correct recognition of the particular right action which is important. Contrary to Socrates, Aristotle recognises that unruly passion can disturb or even overpower the sort of practical knowledge which normally guides right action. It is for this reason that he complains about the type of Socratic inquiry into the essence of virtues which neglects to ask from where and how they come to be. Yet the ground for his complaint cannot be that all knowledge | of essences is [111]
irrelevant to ethical inquiry, since he himself seeks to define each virtue as part of his second-order inquiry. So his point must be that such knowledge is not of primary importance for the goal of ethics, i.e. to become good rather than to know the good.

Introduction

Although the traditional question about whether or not virtue can be taught is never explicitly discussed by Aristotle, we may safely assume that he would approach it in terms of his own distinction between theoretical and practical knowledge. Thus he often states that the sciences which fall under theoretical knowledge are matters for instruction, but he is quite equivocal about whether teaching has any important role to play in acquiring practical knowledge. Yet it does appear that he rejected the pure intellectualist thesis of Socrates about moral education, and that he emphasised the necessity of developing the right habits through control of the passions and proper guidance of the emotions by practical reason. When he addresses the problem of *akrasia* in *EN* VII, however, he is just as puzzled as was Socrates on being confronted with the common phenomenon of people who know the right thing to do, yet still do the wrong thing. Although Aristotle finds it disturbing that reason can be dragged around like a slave by the passions, yet (unlike Socrates) he admits that something like this may be happening within akratic souls whose irrational desires are governing their actions. It is not unqualified ignorance that is responsible for this but rather some kind of qualified or temporary ignorance caused by the passions blinding the rational part of the soul that normally governs actions within virtuous and self-controlled people. In view of the wealth of evidence for the weakness of practical reason in many human lives, the phenomenon of *akrasia* represents a profound problem for moral education that Aristotle addressed in his ethical, political and rhetorical writings. My modest intention here is to use this problem as a starting-point for examining how Aristotle discussed the process of moral education in his ethical writings.

My approach attempts to trace the path of moral education by examining Aristotle's distinctions between *akrasia*, *enkrateia*,[1] and *aretê* | proper. The [44] condition of a moral agent suffering *akrasia* is similar in important respects

[1] Since there is no English translation of *akrasia* that is not misleading, I have resorted to transliterating the Greek term, while sometimes also using *enkrateia* for self-control to underline the opposition within the Greek.

to that of a young person whose rational capacity is not yet sufficiently developed so as to be able to master the strong passions to which all young people are prone. Similarly, the settled disposition of the *enkratês* is akin to that of a promising student whose moral education is sufficiently advanced to enable his rational capacity to reliably control his passions, though he is still being pulled in different directions. Finally, the person of complete virtue has achieved the stable disposition which is the ultimate purpose of moral education, whereby the passions are brought into harmony with practical reason (*phronêsis*) which guides his actions. In this paper I want to elaborate on the suggestion[2] that we can reconstruct Aristotle's account of moral education in terms of different stages of character formation with reference to these different moral conditions.[3]

I. *The Challenge of* Akrasia *for Moral Education*

For any philosopher who wants to credit human reason with a governing role in moral action the common phenomenon of *akrasia* represents an obstacle that can hardly be avoided. Of course, one can always adopt the Socratic strategy of skipping over the problem by simply denying the possibility of *akrasia*. Thus, according to Socrates, if I appear to know the right thing to do while doing the wrong thing then the appearances are deceptive because that is simply a moral impossibility. In fact, my doing the wrong thing provides reliable evidence for my ignorance about the right thing to do because if I really knew the right thing to do then I would do it. On such an intellectualist account, knowledge of virtue is a necessary and (perhaps)[4] also a sufficient condition for performing virtuous actions.

[45] It might seem, however, that the difficulties facing moral education could be best understood by examining its complete failure in the case of a vicious person. But this case is over-determined, as it might be that the person in question has a depraved nature and so is ineducable, or that he is ignorant of the good because of a lack of moral education, or is simply ruled by his

[2] Of course, I am not making any claim to originality here, as similar suggestions have been made by Myles Burnyeat and others.

[3] At *EN* VII, 1 Aristotle lists *akrasia* and *enkrateia* as opposite states of character but indicates that they are not identical with virtue and vice, though they belong to the same genus as them; cf. 1145b1–2.

[4] F. Sparshott (1994: 214n181) draws attention to the paucity of textual evidence for wisdom being a sufficient condition for virtue, according to Socrates.

passions which are in permanent discord with his reason. Thus I think that the problem can be better understood if one begins with Aristotle's analysis of *akrasia*, since that moral condition involves only an occasional discord between practical knowledge and the passions. For some reason, in the case of the akratic person, knowing the good and doing the right thing have not become 'second nature', as in the case of the fully virtuous person. Since Aristotle (unlike Socrates) posits a clear division within the human soul between rational and irrational parts, then a reliable coincidence between feeling and reasoning is always contingent and often dependent on moral education.

First, let us consider some key passages in *EN* VII where Aristotle considers the aporia about *akrasia*. As is typical of such aporetic inquiry, this involves a review of competing opinions about *akrasia* and *enkrateia*, some of which will be rejected while others are adopted within his solution. For instance, he recounts the common view that *enkrateia* is a praiseworthy disposition, while *akrasia* is regarded as blameworthy (1145b8 ff.). Another *endoxon* is that the akratic man does things he knows to be evil because of passion, whereas the enkratic man, knowing his desires to be bad, refuses to follow them because of reason. In general, people regard the temperate man as being always enkratic, while some people identify the akratic with the profligate man, whereas others distinguish them. Sometimes it is said that the *phronimos* cannot be akratic, but some prudent and clever men are sometimes held to be akratic. I think it is clear from this brief review of *endoxa* that Aristotle sees the problem of *akrasia* in terms of the relationship between practical reasoning and the passions.

At VII, 2, 1145b23–29 Aristotle says that when knowledge is in a person it would be terrible if something else masters it and 'drags it around like a slave'.[5] But Socrates had denied the very possibility of *akrasia* when he says that no one acts against what is best, while judging | it to be best, so that if he [46] does so then he must be acting out of pure ignorance. By contrast, Aristotle accepts the phenomenon of *akrasia* but seeks to explain it by inquiring in turn about the *pathos* that the akratic person undergoes, i.e. whether he acts out of sheer ignorance, and what the manner is in which ignorance arises.

In his explanation of *akrasia*, however, Aristotle follows Socrates some of the way along the intellectualist path by ascribing a qualified ignorance to

[5] Perhaps it is significant that Aristotle quotes a passage from Plato's *Protagoras* 352b when attributing to the historical Socrates the claim that *akrasia* is impossible.

the akratic agent. To all intents and purposes, this implies that the problem of *akrasia* belongs to a broader problem in moral education. At *EN* VII, 3, 1146b8–9 Aristotle says that one might raise the problem of whether akratic people act knowingly or not, and in what manner knowingly. This leads him to distinguish two relevant senses of knowing (1146b31–35): one can 'know' in the sense of having but not using knowledge, and in the sense of having and using it.[6] According to Aristotle, it would be very odd if the akratic man both had such knowledge and was exercising it, but not if he merely had it without exercising it.

In terms of the distinction between universal and particular knowledge, it would not be so strange if the akratic agent were actualising only universal knowledge but it would be strange if he were actualising particular knowledge, which is especially relevant for human actions. With respect to the universal, Aristotle makes (1147a4–10) a further distinction, according to which one term applies to the agent, the other to the object, e.g. as to whether this food is such-and-such, the akratic person either does not know or does not activate his knowledge. Furthermore (1147a10–24), within 'having but not using' knowledge, there is a distinction with respect to condition, so as both to have in a way and not to have, e.g. a person asleep, raving or drunk. And this latter is exactly the condition of men under the influence of passion, since outbursts of anger and sexual passion, for instance, involve alterations in the body. Akratic agents might even parrot sentences that appear to reflect knowledge but this has no more significance than if someone in a frenzy
[47] were to rehearse scientific proofs or repeat verses from | Empedocles. Here Aristotle draws a revealing parallel with education: just as those who have begun to learn are merely stringing together sentences (parroting) but do not yet have knowledge because it must become second nature, which requires time, so also akratics are like actors merely reciting their lines.

After introducing a wide-ranging series of distinctions, Aristotle uses them to explain *akrasia*, which falls under the heading of practical rather than theoretical reasoning (1147a27–28).[7] In the case of theoretical reasoning, to draw a conclusion is to make an assertion, whereas in practical reasoning

[6] I am grateful to an anonymous reader for pointing out that the ambiguity in this passage arises between different senses of knowing, i.e. one can know without using one's knowledge. This is held to be possible because one can know without consciously attending to the fact that one knows. What Aristotle holds to be very strange is the possibility that one acts against knowledge that one is consciously attending to at that moment.

[7] See a parallel distinction in *EE* I, 5, 1216b16–18; II, 3, 1221b5–6, II, 11, 1227b28–30; *De Motu Anim.* 7, 701a10–16, 701a23–25.

it is to perform an action if nothing else hinders the agent. A different relation of thought to action is implicit in Aristotle's distinction between two species of *akrasia*, i.e. weakness (*astheneia*) and impetuosity (*propeteia*): 'For some men after deliberating fail, owing to their passion, to stand by the conclusions of their deliberation, others because they have not deliberated are led by their passion' (VII, 7, 1150b19–22, trans. Ross/Urmson). In an earlier passage (1146a35), with specific reference to weak akratics, Aristotle cites the Greek proverb: 'When water chokes, what is one to wash it down with?' Subsequently, he claims that those suffering from impetuosity are easier to cure than those suffering from weakness because the latter fail to abide by the results of their rational deliberation. Furthermore, among the initial phenomena which he wants to accommodate through his distinctions is the difference between the self-controlled agent who abides by his reasoning (*logismos*) and the akratic agent who departs from it.[8] Consistent with Aristotle's account of deliberation and decision in *EN* III, 3, in each case there is a process of deliberation that concludes in a decision taken in advance of action.

At *EN* VII, 4, 1147b25–28 Aristotle specifies the strict sense of *akrasia* as weakness with respect to the 'necessary' sources of pleasure, i.e. eating, drinking and sex (1147b25–28). But there are also qualified types of *akrasia* which are similar to the unqualified sort (1147b34, 1148b6, 13) in that the agent experiences a passion (*pathos*) that overcomes him so that he acts in a way that he had decided not to act, and without having changed his mind. So these analogical cases of *akrasia* must be | specified with reference to the relevant [48] passion, e.g. love of victory, or honour, or gain (1147b31–35). In contrast, the unqualified akratic is mastered by desire for the necessary bodily pleasures. From among the qualified types of *akrasia*, however, Aristotle gives special attention to *akrasia* with respect to *thumos*, which he regards as less morally bad than other forms. One argument for this view is that to feel spirited desires, even ones that lead you astray, is more natural for human beings generally than to feel desires either for excessive amounts of bodily pleasure or for unnecessary pleasures such as lording it over others or being famous or rich (1149b7–20). Aristotle's claim is that *akrasia* with respect to spirited desires reveals a less defective character than does any form of appetitive *akrasia*.

Consequently, he regards *akrasia* as being a peculiar kind of irrational action driven by desire and not judgment:

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[8] See *EN* VII, 1, 1145b10–12, 1146a16–21, 1151a26–27.

> When, then, the universal opinion is present in us restraining us from tasting, and there is also the opinion that everything sweet is pleasant, and that this is sweet (now this is the opinion that is active), and when appetite happens to be present in us, the one opinion bids us avoid the object, but appetite leads us towards it (for it can move each of our bodily parts); so that it turns out that a man behaves incontinently under the influence (in a sense) of reason and opinion, and of opinion not contrary in itself, but only incidentally—for the appetite is contrary not the opinion—to right reason.
>
> (*EN* VII, 3, 1147a31–b3, trans. Ross/Urmson)

From the perspective of moral education, the crucial point is that the akratic man is not as irrational as the brute, for he acts against (and also with) a universal generalisation. Yet he has fallen into a state of 'ignorance', just like that of a man asleep or drunk—physical conditions whose origin and cure can be explained by the natural scientist (1147b6–9). But what is the akratic ignorant of? Aristotle says (1147b10–12, b14) that he lacks knowledge of the final premise, or if he has it he merely recites it but it is not active, e.g. 'I shouldn't taste this' is recited like the verses of Empedocles, while the akratic agent is busy doing the opposite.

Aristotle holds the akratic person to be responsible for acting as he does. In his account of responsibility, however, while men are blamed for ignorance of the universal, yet ignorance of the particular circumstances of an action
[49] usually makes an act involuntary, as long as it is | later rued (*EN* III, 1, 1110b32–1111a2). So the loss of the 'last premises' by the akratic man, which he later rues (1150b30–31), should preclude voluntary action yet Aristotle makes it clear that the *akratês* is a voluntary agent (1146a5–7, 1152a15–16). But this could apply equally to cases of exculpating ignorance (1111a6–7), since only a raving lunatic can know nothing about what he is doing. Aristotle also distinguishes between acting because of ignorance and acting in ignorance (1110b24–27), e.g. the man who is drunk or in a rage acts in ignorance. Thus Aristotle insists that legislators should not accept as an excuse any ignorance for which the agent is himself responsible (1113b24–25). Although akratic action reveals some ignorance, yet the cause of the ignorance is identical to the cause of the action, namely, disorderly passions. But Aristotle does not regard actions done because of spirit or appetite as being rightly called involuntary (1111a24–25), hence it is possible to bring them under control through the right kind of moral education.

Although *akrasia* is a type of perceptual mistake, it is morally blameworthy because it is one's character that causes one to misperceive (*EN* 1114a17–30). For Aristotle the blameworthiness of an act is not determined solely by circumstances, as the relevant question is whether the agent might have a

different character and hence might have acted correctly (1114a4–7). Through self-discipline the akratic agent might have acquired the ability to withstand his sensual desires, such that when confronted with sweet food, for instance, he did not become disoriented and fail to recognise which universal to subsume the food under. It is this failure for which the akratic man is blamed, not for succumbing to the irresistible temptation, given his flawed character. Thus, by contrast with the incurably vicious person who is morally blind, the akratic person can be morally educated because he recognises the right thing to do, even though he occasionally does the wrong thing. Aristotle concludes (1152a27 ff.) that the type of *akrasia* shown by the persons with an excitable temperament is more curable than that of the weak akratics who deliberate about what they ought to do, but fail to keep their resolutions. And those who have become akratic through habit are more easily cured than those who are akratic by nature, as habit is easier to change than nature (1152a30), given that even habit is hard to change, precisely because it seems a kind of nature. Here we might talk about the 'second nature' that results from habitual action.

Another important implication for moral education arises out of Aristotle's distinction between the profligate and akratic (1151a11 ff.): the akratic man is so constituted as to pursue bodily pleasures that | are excessive and [50] contrary to right principle, without any belief that he ought to do so; whereas the profligate is convinced that he ought to pursue them because he is so constituted as to pursue them. The crucial difference is that the akratic can be persuaded to change but the latter cannot, since virtue preserves the basic principle (*archê*) while vice destroys it. And in practical matters, the first principle or starting-point is the end proposed, which corresponds to the hypothesis in mathematics. Aristotle insists that, just as in mathematics there cannot be a teaching account (*logos didaskalikos*) of principles, so also in ethics where they are acquired by virtue, either naturally or by training in right opinion.

Significantly, Aristotle concludes his treatment of *akrasia* at *EN* VII, 12 with the following political analogy: the akratic man resembles a city which passes all the proper decrees and has good laws but which never upholds its laws. By contrast, the wicked man is like a city which consistently adheres to its bad laws. As well as being very apt, this analogy points to the political dimension of moral education within the ancient Greek polis.

II. *The Intermediate Place of Self-Control* (Enkrateia) *in Moral Education*

Aristotle believes that the transition from the premoral to the moral stage will be achieved through personal experience of ethical conduct. Possessing a natural sense of right and wrong, the agent will discover gradually in his own activity the concrete meaning of moral values. Since he is naturally oriented towards the good, he will adopt these values in his own behaviour. Finally, his knowledge of what is truly good will constantly grow, insofar as his irrational propensities have already been guided and directed by his rational conduct. In this way, moral virtue is acquired by performing acts which at the outset are premoral, but which will later become truly ethical.

For Aristotle (*Pol.* IV, 4, 1292a4–37; IV, 8, 1294a3–9) the most general influence on moral education is the rule of law in a political community, as without such civic regulation ethical behaviour is considered to be impossible. According to him, three factors contribute to the development of moral life: nature, knowledge, and training. What is given by nature is not only the passions and their impulses but also the rational faculty and
[51] its distinctive impulses (*EE* VIII, 2). By knowledge here, | Aristotle means practical wisdom or the ability to make right ethical judgments in the variable circumstances of life. This ability ought to be cultivated through moral experience and practice: it is not a matter of merely theoretical insight, as it largely depends on ethical conduct and experience (*EN* VI, 12, 1144a34–b1; III, 5, 1114a31–b5). Aristotle is convinced that immoral conduct influences ethical judgments, since irrational factors disturb the functioning of reason (as in the case of *akrasia*). The third factor is exercise or training, as illustrated by the craft analogy: if someone wants to become a carpenter he has to learn the skills involved by frequently repeating the same acts under the direction of a master, thereby gradually acquiring the habit of doing things properly. Similarly, virtue as a moral habit is the outcome of many previous actions, which have imprinted their traces on the character of an individual. At *EN* II, 2, 1104a33–b13 Aristotle refers to 'right education' (*orthê paideia*) which begins early in life and is mainly concerned with pleasure and pain. The outcome of an adequate education is that people ought to take pleasure in doing good and suffer remorse when they do wrong.

However, passions (*pathê*) are things that happen to us, and are outside our rational control, yet they must be somehow brought under such control if we are to acquire complete virtue, which involves a reliable harmony between reason and feelings. Thus the educational problem posed by *akrasia* can be further understood by examining the case of the self-controlled man

(*enkratês*) whose reason and feelings pull in opposite directions, yet his reason still prevails so that he usually does virtuous actions (if his choice is correct). At *EN* II, 4, 1105b12–18 Aristotle remarks on those who take refuge in discussing virtue, while neglecting to do virtuous actions; like patients who listen carefully to the doctor and then neglect to follow his orders. By contrast, he thinks that the proper way to acquire the virtues is not by a theoretical study of their nature but rather by engaging in virtuous action, which involves both reason and the passions. Yet the moral condition of the self-controlled person could be either a stage in moral education that leads to genuine virtue or it could be a dead-end that results from taking Socratic intellectualism to its stoical conclusion. Incidentally, Aristotle represents *enkrateia* and *akrasia* as two deviations from the normal run of mankind (*EN* VII, 10, 1152a25–33).

In terms of his classification, however, it is more revealing to examine Aristotle's contrast (1151b23) between the akratic and the ascetic man. The latter is a character who takes less than the proper amount of | pleasure [52] in things of the body and who fails to stand by principle in that special sense. Thus for Aristotle the *enkratês* is really a mean between the akratic and the ascetic type as described.[9] He explains that the akratic man departs from principle because he enjoys bodily pleasures too much, and the ascetic (whom Aristotle describes elsewhere as insensible) does so because he enjoys them too little, while the enkratic man stands by principle and does not change as a result of either cause. By way of clarification (1151b28), he explains that, since self-restraint (*enkrateia*) is good (*spoudaios*), it follows that both dispositions opposed to it are bad (*phaulas*), as confirmed by appearances. Yet because one of them (i.e. the ascetic disposition) is found only in a few people and is rarely displayed, then *akrasia* is thought to be the only opposite to *enkrateia*, just as profligacy (*akolasia*) is thought to be the sole opposite of temperance (*sôphrosunê*). According to Aristotle, this is a philosophical mistake in classification that is compounded by language.

In clear contrast to the akratic man, however, there is the *enkratês* who stands firm by his choice and does not abandon it under the impulse of passion. According to Aristotle (*EN* 1151a26–28), it is clear from these considerations that *enkrateia* is a good disposition (*spoudaia hexis*), while *akrasia* is a bad one (*phaulê*). At *EN* VII, 9, he raises the question of whether

[9] This structure is still reflected in the post-Aristotelian work 'On Virtues and Vices', where *enkrateia* seems to be treated as a virtue, while *akrasia* seems to be regarded as the corresponding vice; see 1250b12 ff.

a man is self-controlled (*enkratês*) if he stands by a principle or choice of any sort or whether it must be the right choice. Conversely, is a man akratic if he fails to stand by a choice or principle of any sort, or only if he fails to stand by the true principle and the right choice? Aristotle had already (VII, 7) raised this aporia and now, by way of resolution, suggests that although accidentally (*kata sumbebêkos*) it may be any principle or choice, essentially (*kath' auto*), it is the true principle and the right choice that the enkratic man stands by and that the akratic does not. One important implication of this passage is that *enkrateia* as a moral disposition can serve as a stage in moral education, since it involves adherence to an objectively correct choice, despite the adverse influence of the passions.

The crucial problem facing moral education is how to reconcile reason, which is within our conscious control, with spirit and appetite (the passions
[53] given by nature) which are not within our control but yet | are part of our natural inheritance. Burnyeat (1980) aptly formulates the question as follows: How can reason shape for the best the patterns of motivation and response that reflect the inner child in us (*EN* III, 12, 1119a33)? Aristotle's preliminary answer is that we must be raised in the right way by virtuous parents in a good polity with rational laws, all of which provide us with the right sort of habituation, so that our passions are open to rational persuasion. A philosophical analysis of moral habituation should separate out the appetites and the emotions from practical reason, in order to understand the potential conflicts that manifest themselves in *akrasia* or *enkrateia*, as well as the potential harmony that produces good character and moral virtue.[10]

Let us focus, for instance, on both temperance and courage, which best represent the rational control of natural appetites like taste and touch, and the visceral passion of fear. At *EN* II, 2, 1104a33–b13 Aristotle discusses the 'correct education' which begins in childhood and is mainly concerned with pleasure and pain. According to him, moral qualities are similar to health in that they too can be destroyed by excess or deficiency. Thus someone who runs away from everything in fear becomes a coward, while someone who rushes into every danger becomes rash; whereas courage is the appropriate disposition with respect to fear and confidence. Similarly, whoever indulges

[10] In his discussion of good fortune at *EE* VIII, 2, Aristotle considers the case of a person whose good nature leads him to desire the right thing at the right time, so that he succeeds in acting according to the natural order of things, even though he is foolish and irrational so that he would have done the wrong thing if led by his reason. Such cases of natural virtue are fortunate but stand a long way from complete virtue because reason and the passions may be either in tune or quite discordant.

every pleasure becomes profligate (*akolastos*), while whoever shuns all pleasure like a boor becomes insensible (*anaisthetos*). So Aristotle concludes (1104a25–27) that temperance and courage are destroyed by excess and deficiency, and preserved by the observance of the mean. Furthermore, these virtues are preserved and cultivated by actions that conform to the mean, i.e. we become temperate by abstaining from excessive pleasure (but by indulging in the appropriate pleasures) and we become brave by training ourselves to despise and endure terrors, i.e. we need to learn to fear the right things, as practical reason dictates.

But how will we know that we have achieved the right ethical dispositions? A sign (*sémeion*) will be the pleasure and pain that accompanies our actions. Someone is temperate if he enjoys abstaining from | (excessive) bodily [54] pleasures but profligate (or merely self-controlled) if the abstinence pains him. He is brave if he faces danger with pleasure or at least without pain, but cowardly if he feels pain. In fact, moral virtue in general is concerned with pleasures and pains because pleasure causes us to do base actions and pain causes us to abstain from noble actions. Thus Aristotle agrees with Plato about the importance of children having been trained from childhood to like and dislike the proper things, since this is what good education means.

Yet we still face a puzzle: if pleasure and pain are irrational appetites, how are they to be guided by reason? Unlike the spirited part of the soul, the appetitive part does not listen to reason, and can only be motivated by pleasure and pain. In the *Phaedrus*, Plato suggests that the (base) appetites (black horse) can only be controlled (by force) with the help of spirit (white horse), which listens to reason (charioteer). Aristotle follows on much the same lines, accepting the irrational drive of the appetites in pursuit of pleasure, while allowing them a cognitive (or intentional) aspect that makes them minimally persuadable. At the very least, through the right training or habituation, children can be taught to like the right things, i.e. to take pleasure in the right food in the correct amounts. In other words, the appetites are sufficiently plastic to be moulded and directed towards the right objects. Within the ancient *polis*, such moulding of character was the task primarily of parents and teachers, and ultimately of the law. Thus, through imitating good examples, children can be taught how to control their natural appetites for food and drink. At first, such control is externally imposed by force, if necessary, but gradually it will be internalised, even though the only effective motivation remains pleasure and pain, i.e. through a system of rewards and punishments. But it is here that the spirited desires may be enlisted by reason to help control the irrational desires, e.g. the desire of the child to please

his parents or to win praise and boost self-esteem may help to make him obedient, especially in curbing blind appetites for food and drink.

Aristotle treats (*EN* 1117b23–24) temperance and courage as virtues of the non-rational part of the soul. Temperance in the narrow sense involves moderation in respect of the bodily pleasures of touch and taste (cf. *EN* 1107a33–b4), whereas courage is a mean with respect to fear and confidence. The virtues may involve a mean both in emotions and actions (*EN* 1106b16–24). Virtues of character concern feelings and actions where there is excess and deficiency, and a middle amount, e.g. one can feel too much or too little
[55] fear, and similarly with regard | to actions. Thus children need to learn from parents and teachers, who both possess and display these virtues in their conduct, by imitating them in both feeling and action. In the beginning they do so to gain rewards or to avoid punishment, or because they admire heroes or want to please their elders; but subsequently they learn to internalise these feelings through practice (habituation) so that it becomes second nature to them and they do the right action for its own sake.

But what then constitutes the difference between self-control (*enkrateia*) and genuine virtue? In the first case, the childhood conflict between (internal) passions and (external) reason still remains, even though both are now fully developed internally within the adult soul. In modern Freudian terms, we might think of this as an ongoing conflict between the Id and the Superego. But for Aristotle the key point is that self-control is not identical with the virtue of temperance because there is still a lack of harmony between reason and the desires, since each is pulling in the opposite direction. At *EN* VII, 8, 1151b32 ff., he says that many terms are used in an analogical sense, so that we speak by analogy of the *enkrateia* in the temperate man. Why? Because the temperate man, as well as the self-restrained man, is so constituted as never to be led by the pleasures of the body to go against the principle. But there is a crucial difference (1152a1–2): Whereas the enkratic man has evil desires (*phaulas epithumias*), the temperate man has none, i.e. he is so constituted as to take no pleasure in things contrary to principle. By contrast, the enkratic man does feel pleasure in such things, but is not led by it. For him the inner tension between reason and the passions still remains in place.

Thus self-control can serve either as an intermediate stage on the road to virtue or can become a cul-de-sac if reason and the passions are never brought into harmony. So how is genuine virtue to be developed? Aristotle's well-known answer is that moral virtues are developed through habituation or through the imitation of virtuous action, such as controlling the necessary physical appetites in temperance or controlling fear in courageous action.

In the beginning, however, before the right dispositions have become second nature to the young student of virtue, this will involve no more than self-control because it is not easy to control the base appetites. But, with correct practice, the student acquires the habit of doing things properly and begins to take pleasure in such actions, possibly encouraged by praise and buoyed up by increasing self-esteem, which satisfy the desire of the spirited part for honour. Aristotle says (*EN* II, 2, 1104b18–27) | that every settled [56]
disposition (*hexis*) of the soul realises its full nature in dealing with that class of object by which its nature can be either corrupted or improved. For men are corrupted through pleasures and pains, i.e. either by pursuing or avoiding the wrong pleasures and pains, at the wrong time, in the wrong way, or by some other error of conduct. A keen awareness of the corrupting power of the passions leads some thinkers (e.g. Speusippus) to define the virtues as states of impassivity (*apatheia*) or tranquillity (*êremia*). For Aristotle, however, this is a mistake because such people use the term absolutely (*haplôs*), without adding qualifications as to manner and time. But (one might object) surely their mistake is the complete suppression of the passions, instead of developing the proper rational control or ethical disposition which allows them their due satisfaction. The slippery slope of *akrasia* or the cul-de-sac of self-control cannot be avoided simply by silencing or suppressing the passions through rigid rational control, as the later Stoics tended to do, possibly taking their lead from Speusippus.[11]

But how does the virtuous person deal with the disruptive potential of the base pleasures? In some places (*EN* 1109b7–12) Aristotle appears to fall back on some popular wisdom about the dangers of pleasure, when he warns that when pleasure is on trial we do not judge impartially. Thus, by referring to the *Iliad* (3.156 ff.), he advises that we should behave towards pleasure as did the elders of Troy towards Helen, since if we dismiss pleasure in this way we shall be less liable to error and better able to strike the mean. Yet this seems to conflict with what Aristotle says elsewhere about the good man taking pleasure in virtuous actions. That conflict is only apparent, however, since he is referring here to the necessary physical appetites for food, drink and sex, which remain potentially unruly.

The situation may be clarified further by examining the virtue of courage with the reference to the pains and pleasures involved in that ethical disposition. At *EN* III, 9 Aristotle says that courage is more particularly displayed in regard to objects of fear, so that men are called courageous

[11] I am indebted to John Dillon for this suggestion; cf. Dillon 2003: 76–77.

for enduring pain. Thus courage is rightly praised, says Aristotle, because it is harder to endure pain than to abstain from pleasure. In fact, however, he insists that the end (*telos*) corresponding to the virtue of courage is actually
[57] pleasant (*hêdu*) but that it is obscured by | the attendant circumstances, especially the threat of death. He admits that death and wounds will be painful to the brave man and will be suffered involuntarily. Yet he will endure them because it is noble (*kalon*) to do so, or because it is base (*aischron*) not to do so. Indeed, Aristotle emphasises that death will pain a courageous man more than a coward because his life is worth more, given that he is virtuous and good; so that he knows that he stands to lose the greatest goods. But this awareness makes him more (not less) courageous because he prefers glory (*kalon*) to the greatest prizes in life. Aristotle points out that it is not the case that the exercise of this virtue is pleasant, except insofar as it reaches its end. The coward is motivated by the baser pleasure of safety, whereas the courageous man is motivated by the pleasure of future glory and faces death willingly, though he unwillingly suffers pain. Presumably the self-controlled man stands firm out of a sense of rational duty to his city or to avoid shame but he cannot enjoy the pleasure of future glory because his passions and his reason are in conflict. In the case of the courageous man, however, the desire for glory helps him to overcome the base appetites.

III. *Transition from Habitual to Complete Virtue*

But what else beyond a settled disposition to do virtuous actions is required for complete virtue, according to Aristotle? His answer is given in terms of practical wisdom but it is unclear what this adds to habituation. In order to understand such an answer, we should begin with his methodological principle that seekers after knowledge always proceed from what is more familiar to them to what is more familiar by nature. Thus for those who are seeking practical wisdom the beginning of inquiry is 'the that' (*to hoti*) in the moral sphere (cf. *EN* I, 4, 1095b14). This fits quite well with what Aristotle says about the appropriate audience for lectures on ethics, namely, that they must have experience of the actions of life, along with a good upbringing, so that they are ready to listen to talk about the good (*EN* I, 3, 1095a2–4). Presumably, he could give this as one of the reasons for the debacle of Plato's infamous lecture on the good.

In fact, Aristotle lists habituation as one of the ways (along with induction and perception) of grasping 'the that'. In other words, we become acquainted with noble actions and acquire virtuous dispositions by imitating noble

actions. Yet this is still inadequate for achieving | complete virtue, which [58]
requires practical wisdom. Aristotle talks about beginners in any subject who can string together propositions in an orderly way, but do not yet know them. Why not? He explains that the knowing of such propositions must become second nature to them, and that this takes time. In modern terms, we might say that they must internalise practical wisdom, so that they will always act virtuously, even when pleasure tempts them to do otherwise. In fact, if they experience an internal conflict between their desires and their reason, this is a sign that they are not yet virtuous but are merely self-controlled and perhaps even vulnerable to *akrasia*.

In effect, those who are to become completely virtuous must reshape their pleasures so as to remove potential conflicts with their reason. This change in character is not simply a product of moral habituation, since it also involves a cognitive transformation from merely grasping 'the that' to understanding 'the because' (*to dioti*). We can find evidence for this in *EN* X, 9, 1179b4–31, where Aristotle suggests that only someone who already loves what is noble and so takes pleasure in it can benefit from lectures on ethics. Burnyeat (1980: 76) has already noticed that this is the key to Aristotle's solution to the problem of how practice (habituation) can lead to knowledge. Complete virtue requires that the unreasoned desires of the appetitive part of the soul be brought into line with the reasoned desire (*boulêsis*) of the rational part, which is itself informed by a reflective scheme of values organised under the heading of the good. These rational desires are based on an evaluation of their objects as noble or good, just as appetitive desire is oriented to objects that are pleasant, while spirited desire is oriented to objects that are noble.

So what are the key differences in character between the virtuous person, the vicious, and the self-controlled person? According to Aristotle, someone would be completely foolish (*aphrosunê*) if they did not live according to their own *prohairesis* by setting some goal for their lives, whether that be honour, wealth, or noble action. In this context *sôphrosunê* might be understood in the broad sense of soundness of mind, which Plato links with shame in the *Charmides*. Aristotle seems to be implying that living according to *prohairesis* is derived from a sense of self and a general life-purpose. As Nancy Sherman (1985: 100) suggests, good character is reflected in the truly fine goals that one adopts for action. Of course, both *prohairesis* and *boulêsis* could be taken as neutral capacities possessed by the virtuous and vicious alike. For instance, *boulêsis* might simply | involve being guided by certain ends which one takes [59]
to be constitutive of happiness, i.e. a wish can be for an apparent practical good, even if that aim should bring the agent great evil (*EN* 1113a24, 1142b19, *EE* 1223b8, b33).

Thus *prohairesis* appears to be a kind of instrumental rationality for choosing the means to gain ends that are independently chosen through *boulêsis*. So the vicious person can exercise *prohairesis* for evil goals, just as the virtuous person can pursue fine goals, while the clever person is equally adept at achieving either sort of goal. When we consider the role of *phronêsis*, however, it would seem that practical wisdom cannot be separable in this way from virtue, since Aristotle insists (*EN* 1107a1, 1145a1–5) that an agent cannot be practically wise without being virtuous. Even though the non-virtuous person may possess the deliberative capacity that Aristotle calls cleverness (*EN* 1144a24), yet he suggests that there is an integral link between having practical wisdom and espousing virtuous ends. This can be clarified by means of a comparison with the prohairetic capacity of the profligate person (*akolastos*), whose goal is always to satisfy the present pleasure (*EN* 1146b24). Although the *akolastos* decides on some action with conviction, yet the bestial life that is chosen will inevitably affect his prohairetic capacity (*EN* 1095b20, 1150a20, 1151a6–7). His practical reason will deteriorate as a result of neglect and profligacy (*EN* 1140b12–19, 1179, 1180a5–12).

Thus, in both the profligate and self-controlled person, reason is primarily instrumental insofar as it serves a value external to itself, which is established by wish, e.g. the desire for pleasure or honour. For Aristotle, however, the man of practical wisdom in the proper sense has the capacity to revise ends (so his reason is not a 'slave of the passions', as Hume would have it). By contrast, he characterises (*EN* VII, 8) the base individual as being incurable, like someone with dropsy, since he acts without repentance or with a full awareness of his vice (1150b29–35). Even if the vicious person was once able to revise his goals, this is no longer possible because vice corrupts the principle (*EN* III, 5, 1114a14–24, VI, 5, 1140b17–20). Indeed, not only the goals themselves are corrupted by vice but so also is one's ability to perceive them. Practical wisdom, on the other hand, preserves judgment about moral action, while vice destroys that judgment (*EN* 1140b10–16). What the vicious person lacks is the ability to 'see' (*theôrein*) the human good. For this reason, as Aristotle suggests elsewhere (*EN* X, 9, 1180a11–12), a base person should be treated like
[60] a beast of burden, since passion | seems to yield only to force. Such a person neither listens to arguments that are meant to dissuade him nor does he understand them even if he does listen (1179b26, 1180a5).

But what about the clever and self-controlled person who can revise his goals (as given by passion) if they conflict with other ends? He is still different from the virtuous person whose activity is fine (*kalon*) insofar as it is praiseworthy and constitutes its own end. Aristotle contrasts (*EN* 1115b12, 1116a12, 1120a23) acting for the sake of the fine with acting for the

sake of expediency or extrinsic pleasure. The crucial difference is that the fine is an immanent end of virtuous action, not some additional value. In Aristotle's terms, virtuous action is not a *poiêsis* (with an external product) but rather a *praxis*, i.e. an action that is its own end. While some external effect (like defending the city) can be part of the goal of virtuous action, this is not its primary value for the virtuous agent, since it is the quality of the action (defending bravely) and his state of character (brave not rash) that determines it as virtuous. Thus the fineness of the action depends on how one acts in achieving that end, and how one constitutes the action, i.e. one's choice of appropriate means to that end.

However, the most distinctive task facing practical knowledge is finding the mean in human action, since there is no mathematical or theoretical knowledge of such a mean precisely because it varies for different virtues and for the particular circumstances in which they are exercised. In all cases, finding the mean involves a particular choice or decision rather than some universal proposition or maxim. Yet Aristotle seems hopelessly vague and even circular when he claims that hitting the mean involves acting in the same way as a *phronimos* would act. Like the Lesbian rule, the *phronimos* himself is the appropriate measure for what resists the universality of the straight-and-narrow, since there cannot be any universal measure (like Plato's Form of the Good) for all virtuous actions. There is however an independent and objective measure which the man of practical wisdom manages to discover within the particular situation of practical action.

But, one might object, what about the person with very strong appetites whose reason manages to hold them in check consistently, so | that he [61] performs virtuous actions?[12] Surely, he has hit on a mean that is appropriate for him. Aristotle's answer (*EN* 1105b5) is that an agent qualifies as temperate, not merely by doing the right actions (like the self-controlled man) but by doing them in the same way as a temperate man does them. His considered view is that it is the practical knowledge of the *phronimos* that determines the correct intermediate degree of *pathos* that constitutes a virtuous disposition.[13] According to the standard definition (*EN* VI, 5, 1140b20–22), *phronêsis* is a truth-attaining rational quality concerned with action in relation to things that are good for human beings. This definition implies that the mean which is determined by the *phronimos* is objective (not subjective) precisely because

[12] I owe this objection to Susan Bencomo, whose generosity with critical comments and suggestions helped me to improve this paper.

[13] *EN* II, 6, 1107a1–2, *EE* II, 3, 1220b28, II, 5, 1222a8.

it is true. Of course, *phronêsis* is concerned with objects of deliberation which can vary, so that they can qualify as objects of choice, yet a good deliberator is someone who can arrive by means of calculation at the best goods that are attainable by man (*EN* 1141b8–15). While Aristotle draws a distinction between knowledge of general principles and of particulars, he insists that *phronêsis* must involve both kinds of knowledge since it is concerned with practical affairs, which involves knowledge of particular actions and decisions.

Among modern scholars it remains controversial whether Aristotle thinks that the *phronimos* must have an explicit conception of *eudaimonia* as an ultimate end, when he is facing a particular decision or action. As evidence that *phronimoi* do not need to have such a conception, Sarah Broadie (1991: 185 ff.) points to *EN* VI, where Aristotle fails to spell out any conception of the ultimate end held by the practically wise man. On the other hand, however, Aristotle does think of practical reasoning as requiring a conception of an end to be achieved which he refers to as the universal premise. Yet he never spells out its content, possibly because he has discussed *eudaimonia* in detail elsewhere (*EN* I, 7; X, 6–8). And, even if there are some gaps in Aristotle's account of the ultimate end, that might be the case, as Bostock suggests (2000: 84), because he didn't himself know how to fill them.

But would Aristotle agree with Broadie that the *phronimos* has no conception of an ultimate end (and does not need it)? As evidence to the contrary, Bostock points to *EN* VI, 5, 1140a25, where Aristotle claims that it is typical of the *phronimos* to deliberate well about what is good and advantageous for himself, not in some particular respect, but as to living well in general. Similarly, at *EN* VI, 7, 1141b9–14, Aristotle says that good deliberation is especially
[62] the task of a *phronimos*, i.e. one who | aims at what is best of all things attainable in action. Bostock takes the reference in both cases as being to a supreme end, namely, *eudaimonia*. Finally, at *EN* VI, 9, 1142b28–33, Aristotle specifies that unconditionally good deliberation is correct about what is unconditionally the end of human action, whereas a particular kind of deliberation is directed to particular ends. So, if good deliberation is characteristic of the *phronimos*, it will be a correctness concerning what is expedient (*sumpheron*) for that end of which *phronêsis* is the true apprehension. Bostock (2000: 85) argues convincingly that these three passages clearly attribute to the *phronimos* a true conception of *eudaimonia* but that they say nothing specifically about this conception. While Aristotle claims that the goal of virtuous action is one's own *eudaimonia*, he offers no criterion for criticising different conceptions of this goal. Furthermore, Bostock objects (98) that Aristotle says nothing that addresses the problem of how to distinguish dispositions of

character which are virtuous from those which are not. He connects this with another gap in Aristotle's discussion, namely, that he gives us no analysis of the concept of the 'noble' (*to kalon*). All of these are legitimate objections which identify certain inadequacies in Aristotle's account of complete virtue from a modern theoretical perspective. But perhaps such objections run the risk of overlooking the pragmatic perspective from which Aristotle describes the *phronimos* as a generally accepted paradigm of the practically wise person, such as Pericles or Socrates, who can be relied upon to make consistently good practical decisions both for himself and for his city.

Conclusion

In this paper I have argued rather schematically that Aristotle's views on moral education are best understood in terms of the type of character that it is intended to produce, as well as the deviant kinds of character which it can help to prevent. Thus *akrasia* represents a common failure in moral education, which is particularly distressing in that it seems to highlight the impotence of reason when faced with strong passions. However, the appropriate response is not to suppress the passions, as does the self-controlled person, but rather to persuade them to cooperate with practical reason in performing moral actions. This can only be achieved gradually through moral habituation, whereby the appetitive and spirited parts of the soul can learn to enjoy cooperating with reason in doing the right thing. The ultimate goal of moral | education is to produce the completely virtuous [63] person in whom the passions are consistently in harmony with reason, as a result of moral habituation, but who also understands how moral actions promote his ultimate goal of *eudaimonia*. Such a person embodies Aristotle's ideal of the noble gentleman (*kaloskagathos*) who possesses all of the virtues and who performs fine actions for their own sake, while knowing them to be fine and good (*EE* VIII, 3,1248b8–1249b18).

HISTORY OF MATHEMATICS

Introduction

In this paper I argue that Plato's *Timaeus* should be understood in light of the purportedly Socratic 'autobiography' in *Phaedo* 96–100, even though the *Apology* claims that Socrates took little or no interest in cosmological speculation. Extant reports (*Met.* 987b1–3) about Socrates' philosophical activity also testify to his lack of interest in mathematics and in physics, while the early 'Socratic' dialogues consistently confine him to pursuing moral questions by means of his famous elenctic method. By contrast, the *Meno* presents a 'Socrates' who uses mathematical diagrams to teach a slave boy something about geometry, so as to illustrate and defend a theory of recollection which can hardly be attributed to the historical Socrates. Finally the *Phaedo*, which develops a more elaborate version of this theory, the so-called 'autobiography' of Socrates, tells about an early interest in cosmological speculation which he gave up in disappointment because it failed to answer his questions. This inconsistency in the representation of Socrates I see as a clear hint that in the *Meno* and *Phaedo* Plato is self-consciously going beyond his mentor by introducing the hypothetical method of mathematics, combined with a metaphysical and epistemological theory of recollection.

Furthermore, I claim that the so-called 'autobiographical' passage in the *Phaedo* can be treated as Plato's own path to the cosmological theory which is developed fully in the *Timaeus*. Since this cosmology is narrated by a Pythagorean from Sicily in the sort of 'long speech' which Socrates deplored, it is quite clear that Plato has abandoned any pretence of merely expanding the ideas of his mentor. Yet Socrates does appear as a minor character at the | [420] beginning of the *Timaeus* dialogue where its project is explicitly connected with that of the *Republic*, although it is clear that, with the possible exception of Book I, the *Republic* is not a typical Socratic dialogue nor does it expound the political ideas of Socrates. Still one can read the whole dialogue as a response to the Socratic problem about how virtue is to be acquired, which is underlined by his paradoxical claim that no one does wrong knowingly. In order to examine the thesis that virtue is knowledge, Plato constructs an ideal polis with its distinct classes, each of which displays a distinctive virtue that is inculcated by a different curriculum of education. Thus, in general, it is plausible to read the *Republic* as a 'thought-experiment' by

means of which the deeper (i. e. Platonic) meaning of the Socratic dictum that virtue is knowledge is grounded in an ideal political order. Similarly, I think that the *Timaeus* can be interpreted as a parallel construction of an intelligible cosmology which is a necessary presupposition for the sort of teleological explanation that the 'Socrates' of the *Phaedo* seeks in his purported autobiography. Now that I have given a general overview of my interpretive approach, let me try to make it more plausible with reference to Plato's texts.

I. *The Demand for Teleological Explanation*

At *Phaedo* 96a Socrates narrates his so-called 'autobiography' with reference to the question of Cebes about whether human souls are really indestructible and immortal and not just long lasting. Socrates admits that this is a very difficult question whose discussion demands an account of the causes of generation and corruption in general. It is within this dialogical context that Socrates recounts his supposed intellectual experience as a younger man when he had a remarkable enthusiasm for the kind of wisdom called natural science (περὶ φύσεως ἱστορίαν) (96a7–8). His enthusiasm was motivated by his belief that it would be magnificent (ὑπερήφανος)[1] to know the reasons for everything, e.g. why a thing comes into being (διὰ τί γίγνεται), why it perishes (διὰ τί ἀπόλλυται), and why it exists (διὰ τί ἔστι). Socrates gives a sample of the typical questions posed by natural philosophers: Do living creatures develop when putrefaction develops from the conjunction of the hot and the cold? (Archelaus) Do we think with our blood, or with air, or with fire? (Anaximenes, Heraclitus, Empedocles) Or is thought due to something else, namely, the brain providing sensation which gives rise to memory and judgment, and ultimately to knowledge? (Alcmaeon) Further questions ask about how things perish, and about what goes on in the heavens and the earth.

According to Socrates, his lack of success with these questions convinced him that he had no gift for such inquiry because, instead of learning something new, he became totally confused about what he thought that

[1] Since it is derived from the verb ὑπερηφανέω (which is ambiguous between 'being conspicuous' and 'being arrogant'), this adjective may contain an implied critique of the arrogant claims of the *physiologoi*, especially as these were transmitted and used to support the pretentious claims of sophists like Gorgias. In view of later passages, however, it may be seriously intended in praise of the search for final causes.

he already knew. For instance, with regard to the question of what causes a human being's growth, it had always seemed obvious (δῆλον) that he grew because he ate and drank, with the result that flesh was added to flesh, bone to bone, and so on for the other parts the body. Just as this account seemed appropriate (μετρίως), so it had also appeared sufficient (ἱκανῶς) to say that a man was taller than another 'by a head' (τῇ κεφαλῇ) or that 10 was more than 8 by the addition of 2, or that 2 metres was longer than 1 metre 'by the half' (διὰ τὸ ἡμίσει).[2] But, as a result | of dabbling in physical inquiry, Socrates no [421]
longer thinks that he knows the cause (αἰτία) of any of these things.

Against the background of such intellectual confusion, Socrates recounts (97b–c) how he heard someone reading from a book of Anaxagoras which said something about Mind (νοῦς) arranging all things as a cause. Socrates is represented as being delighted to hear this because he felt it was good (εὖ ἔχειν) that Mind should be the cause of everything. He himself draws the inference that, if this were true then Mind must do all its ordering and arranging in the fashion that is best (βέλτιστα) for each individual thing. Hence, if one wanted to discover the cause for anything coming into being (γίγνεται) or perishing (ἀπόλλυται) or existing (ἔστι), the right question to ask was how it was best (βέλτιστον) for that thing to exist or to act or be acted upon. Now these are exactly the same questions which Socrates had posed earlier (96a) in recounting his initial enthusiasm for natural science. This shows, I think, that Plato sees Socrates rather than Anaxagoras as anticipating the teleological approach to inquiry, even though the historical Socrates seems have had no interest in physical inquiry (ἱστορία).

This point is confirmed by the subsequent inference which Socrates is made to draw from a mere hint in Anaxagoras' theory that Mind is the cause of the cosmos. According to such an account, he reasons (97d3) that the only thing a man had to think about was what is the best (τὸ ἄριστον) or what is the highest good (τὸ βέλτιστον). The important point is that Socrates is represented here as already adopting a teleological perspective before he read Anaxagoras, presumably because he always inquired about good and evil. For instance, at 97d5 Socrates says that such calculating (λογιζόμενος) led him to the delightful belief that he had found in Anaxagoras a teacher about the cause of things that corresponded to his own thinking (διδάσκαλον

[2] Hackforth (1955: 124n1) notes that the strange way of expressing double length is due to Socrates' wish to put this instance on all fours with all the other examples; so that A is bigger than B because of something having happened to A. The point is that such a sophistical way of putting things leads to confusion.

τῆς αἰτίας περὶ τῶν ὄντων κατὰ νοῦν ἐμαυτῷ). Here are some of the questions he wants to ask such a teacher: 1) Whether the earth is flat or round, and why is it better (ἄμεινον) for it to be as it is. 2) Whether the earth is in the centre of the universe, and why it is better for it to be there. The questions that Socrates wished (97e) to have answered correspond to the typical inquiries of both Ionian and Pythagorean *physiologoi* except for the addition of the teleological dimension.

If Anaxagoras were to answer all these questions satisfactorily, Socrates declares (97e) himself ready to give up the quest for any other cause. I think that this is a subtle reference to an alternative method which Socrates had already mentioned (97b6–7) as a substitute for the method of the *physiologoi*, and which is produced again as a 'second sailing' (δεύτερος πλοῦς) when the search for teleological causes breaks down. In the meantime, however,
[422] Socrates still hopes that Anaxagoras can 'deliver the goods', so | to speak, and he extends the range of his inquiry to the sun, moon, and stars; so as to discover which is the better way (ἄμεινον) for these bodies to act and be acted upon. As if the point were not clear enough, Plato takes the trouble to list (98a–b) the anticipations of Socrates in approaching Anaxagoras as a possible teacher. For instance, when Anaxagoras had said that things are ordered by mind (ὑπὸ νοῦ κεκοσμῆσθαι), Socrates had never supposed that he would bring in some other cause (ἄλλην τινὰ αἰτίαν) and not rest content with showing that it is best (βέλτιστον) for them to be as they are. In fact, he imagined that Anaxagoras would explain what was best for the individual (τὸ ἑκάστῳ βέλτιστον) and what was the general good (τὸ κοινὸν ἀγαθόν). With such cherished hopes (τὰς ἐλπίδας), Socrates rushed off to buy the books of Anaxagoras in order to discover as quickly as possible what was best (τὸ βέλτιστον) and what was worst (τὸ χεῖρον) (98b5–6).

I think it is indubitable that Plato represents Socrates as expecting teleological explanations from the writings of Anaxagoras. This is also confirmed by the account (98b–c) of how the marvellous hopes of Socrates were dashed when Anaxagoras made no use of Mind as a cause for setting things in order (τὸ διακοσμεῖν). Instead, he is reported to be finding causes (αἰτιώμενον) in air and aether and water, and a host of other absurdities (ἄτοπα). The language here clearly conveys Plato's own dismissive attitude towards Anaxagorean explanation, especially when he compares it with an analogous explanation that might give for Socrates' decision to stay in jail rather than escape as his friends had urged. According to the comparison, Anaxagoras is like someone who says that Socrates acts in this way because of Mind and then tries to explain his actions in terms of the bones, sinews, joints, and all the other parts of the body necessary for sitting in a certain way.

For Plato this is just as ridiculous as giving the cause of Socratic conversation (διαλέγεσθαι) in terms of sounds, air currents, streams of hearing, and so on.

As expressed through the character of Socrates (98d), the Platonic critique of such accounts is that they neglect the true causes (τὰς ὡς ἀληθῶς αἰτίας), namely that, since the Athenians thought it better (βέλτιον) to condemn him, he also thought it better to sit there. In other words, Socrates thought it more just (δικαιότερον) and proper to stay where he was and submit to the punishment handed down by the court rather than to run away. If it had been up to his old bones, he jokes, they would long ago have fled to Megara or Boeotia, driven by their opinion of what was best (ὑπὸ δόξης φερόμενα τοῦ βελτίστου). This characteristic Socratic joke underlines the point that a moral decision to accept the death penalty would be unintelligible without appealing to the fact that Socrates thought it right and proper (δικαιότερον καὶ κάλλιον) to submit to the law. On the other hand, it would be quite absurd (ἄτοπον) to appeal to such things as bones and sinews, unless one meant to say that Socrates could not have carried out his decision without having such things (ἄνευ τοῦ τὰ τοιαῦτα ἔχειν). Obviously Plato has some predecessor like Anaxagoras in mind when he criticises (99a) explanations of intentional actions in physical terms rather than in the appropriate terms of choice of what is best (τῇ τοῦ βελτίστου αἱρέσει). For him this represents a failure to distinguish between the cause of a thing (τὸ αἴτιον τῷ ὄντι) and that without which the cause would not be a cause (ἄνευ οὗ τὸ αἴτιον οὐκ ἄν ποτ' εἴη αἴτιον). In modern jargon, this is the distinction between a cause and its necessitating condition.[3] It corresponds also | to the distinction at *Timaeus* 46c between [423] final causes and auxiliary causes, except that there they are distinguished as two sorts of cause. Later, I shall discuss this upgrading of necessitating conditions to causes.

At *Phaedo* 99b, however, Plato says quite clearly that the *physiologoi* are groping in the dark when they mistakenly describe as 'causes' the sort of cosmological explanations which they offer. For instance, one man (Empedocles?) is reported to have said that the earth is kept in position by the revolving heavens which generate a kind of whirl (τις δίνη). Obviously, the physical analogy is with a heavy ball which is kept at the centre of a whirlpool by centripetal forces. Some other thinkers (Anaximenes,

[3] Mittelstrass (1962) describes this as the distinction between final and efficient causation, which is rather misleading because the latter is associated with what Aristotle calls the cause of motion, and this is certainly not what Plato had in mind with necessitating conditions.

Anaxagoras, Democritus) view the earth as a flat lid that is supported on a base of air. Once more, this explanation of the stability of the earth appeals to familiar empirical analogies, and I think that it must be such tendencies that Plato has in mind when he describes these people as searching for a stronger (ἰσχυρότερον) and more immortal (ἀθανατώτερον) Atlas who is better able to hold things together (μᾶλλον συνέχοντα). The central point of his critique is that they have no inkling of the divine power (δαιμονίαν ἰσχὺν) which puts things in the best possible (βέλτιστα) positions. He means that their preoccupation with the observable forces of the physical world has blinded the *physiologoi* to the possibility of invisible and intelligible forces that for Plato must be understood in terms of the intentional action of a moral agent. This is the fundamental reason why he sees Socrates rather than natural philosophers like Anaxagoras as having anticipated the possibility of teleological explanations for the structure of the universe. Such a possibility is precisely what Plato himself tries to realise in the *Timaeus* dialogue.

II. *The Project of Plato's* Timaeus

In this dialogue Timaeus undertakes to speak first about the origin of the cosmos and then about the birth of mankind. For the purpose of understanding the dialogue, Gadamer[4] has shown us how to listen for changes of tone and shifts in the mode of discourse. For instance, the solemn manner of the proem emphasises initial distinction (which guides the subsequent discussion) between that which is always Being (τὸ ὄν ἀεί) and has no Becoming, and that which is always Becoming (τὸ γιγνόμενον
[424] ἀεί).[5] The | first is grasped by thought with the aid of reasoning (νοήσει μετὰ λόγου) because it is always unchangeably real. In contrast, the second is an object of belief (τὸ δοξαστὸν) which is grasped by opinion with the help

[4] See Gadamer 1980: 156–193. He notes a distinct difference between mythical narrative about the realm of Reason and the almost technical discourse on the realm of Necessity. With respect to this difference, Gadamer remarks upon the apparent absence of the Demiurge from the mathematical prestructuring of the Receptacle.

[5] It has been suggested by Whittaker (1969: 181–185) that the second be excised because it has poor manuscript authority. This suggestion has recently been revived by Robinson (1987: 103–119) in support of his literalist interpretation of the dialogue. But Zeyl (1987: 120–125) resists that suggestion and proposes an alternative reading of the passage, which also supports the literalist position. He suggests that the guiding distinction introduces two general categories of being (e.g. *kath' auto* and *pros ti*) under which entities will subsequently be classified; cf. *Tim*. 51d ff.

of unreasoning sensation (δόξῃ μετ' αἰσθήσεως ἀλόγου) because it becomes and perishes but is never really real (ὄντως ὄν).[6]

Such an ontological-cum-epistemological distinction determines Timaeus' subsequent discussion until its explicit amendment with reference to the knowledge of the Receptacle. Thus, he argues, the existence of a whole class of things that are generated requires the agency of some Cause since, without a cause, it is impossible for any generated thing even to come into existence. This is the axiom that justifies the introduction of a Demiurge as an active agent in Plato's cosmology, though not as an omnipotent creator.[7] For one thing, Timaeus insists that the Artificer (δημιουργὸς) must keep his gaze fixed on an eternal and unchanging model if he wants the generated object to be beautiful. So, whenever the craftsman uses a generated or crafted model for his work, the end result will not be beautiful. The Beautiful (τὸ καλόν) here functions as a cosmological principle for shaping the visible world.[8]

The initial distinction is again used when Timaeus addresses the primary question about the whole Heaven (πᾶς οὐρανὸς) or the Cosmos (κόσμος), namely, whether it has been generated or not (*Tim.* 28b3 ff.). His answer is that it has been generated because it is visible (ὁρατὸς) and tangible (ἁπτὸς) and possessed of a body (σῶμα ἔχων).[9] All such things are sensible and are

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[6] When Timaeus adds the qualification 'in my view', this may indicate that he is being treated here as a mouthpiece for Plato himself, since this cannot have been the view of those Pythagoreans who (according to Aristotle's reports) naively identified the being of number with the being of reality as a whole. Such a Pythagorean view may have prompted Plato's discussion of the works of Reason, as a view to be superseded by his own more sophisticated distinction between the objects of reason and the object of belief and sensation; cf. *Met.* 987b10–13, b29–34.

[7] Vlastos (1975: 26 ff.) sometimes talks about the Demiurge as the 'creator' of the cosmos but clearly he does not mean that there is creation *ex nihilo*, since he recognises the existence of a primordial chaos. In personal correspondence Vlastos has defended his talk of a 'creator' by drawing the analogy with Michelangelo as the creator of a sculpture and I concede that such an analogy is just right for the *Timaeus*.

[8] The precise relationship between the Demiurge and the Form of Beauty is rather obscure but the text implies that they are two distinct entities one of which guides the ordering activity of the other. In Aristotle's terms, this is the relationship between the final and the moving cause, both of which find the conceptual framework developed through the example of craftsmanship. If one were to accept G.E.L. Owen's suggestion (1953) about an early date for the *Timaeus*, one could refer to the cosmic craftsman at *Republic* 596b, although there he seems to be also held responsible for making the original model of the bed. We might also look for a clue to the *Philebus* where the Good shows itself in the Beautiful—both of which are guiding principles for right action and for ordered construction in the *polis* and in the *kosmos*.

[9] Robinson (1987: 119) thinks this argument may involve a category mistake, since the universe is not like any ordinary sensible object that may be perceived by the senses and

therefore generated, since they are grasped by opinion with the help of the senses. We can see how guiding distinction functions here as a criterion for deciding to which ontological realm any object will belong.[10] Having argued that the Cosmos must have been generated, Timaeus claims that there must be some cause of its generation. But here he hesitates, first, because of the difficulty of discovering the Maker (ποιητὴν) and Father (πατέρα) of this universe and, secondly, because it would be impossible (ἀδύνατον) to explain such a cause to all men.[11] Yet I think he leaves open the possibility of explaining it to a small band of initiates, i.e. mathematicians.

As a result of his prologue, we know that Timaeus thinks it possible to give only a plausible account of the origin and development of the visible world with which he is concerned.[12] Within the visible cosmos, however, he makes a further distinction between 'the works of Reason' (τὰ διὰ νοῦ δεδημιουργημένα) and 'what comes about of Necessity' (τὰ δι' ἀνάγκης γιγνόμενα) (*Tim*. 47e3 ff.). Hence the general plan of his discourse is first to concern himself with the works of Reason, then with the works of Necessity and, finally, to attempt a reconciliation between the two in his account of the generation of mankind.[13] Here I discuss only the first part of his discourse, with some essential

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categorised as a whole. Such a Kantian criticism may be inappropriate as an objection to Plato since he seems to reject the Atomist distinction between 'universe' and 'cosmos' when he lists them as synonyms here.

[10] In terms of such a distinction we should try to make sense of Aristotle's report that Plato posited mathematical objects as an intermediate class of entities; see Annas 1975a: 146–165. Perhaps it is significant that the 'materials' out of which the world-soul is constructed are described as 'in the middle' (ἐν μέσῳ) between eternal and generated Being, since the souls of mortals are constructed out of a similar (though less pure) mixture of Intermediate Sameness, Otherness and Being (*Tim*. 35a–b, 41d). Thus, on the principle of like to like, human souls can grasp the intelligible mathematical structure of the cosmos.

[11] Vlastos (1975: 25) claims that the ordering activity of the Demiurge is 'supernatural' and therefore does not fall under the class of events that can be given a natural explanation. While this may be true enough, I think Plato does not exclude the possibility that this activity may be rendered intelligible in terms of mathematical construction.

[12] Taylor (1928: 61) interprets the 'likely story' of the *Timaeus* to mean that Plato's doctrines are tentative and open to correction in the light of new facts, according to the method of 'saving the phenomena' which Taylor takes to be similar to the modern method of scientific hypotheses that are tested experimentally. But this does not correspond with Plato's method of hypothesis which is adopted from geometry and which thus tends to examine the internal consistency of conclusions with assumptions; cf. R. Robinson 1953: 107–108 and J. Mittelstrass 1962.

[13] Vlastos (1975, ch. 2) assumes that the section on Reason is exclusively concerned with the structure of the heavens, whereas the section on Necessity deals with the structure of matter. While this division seems to correspond well with the textual evidence, one must wonder why each section offers a different mathematical analysis of the four elements and their interrelationships.

references to the second and the third. It seems that the so-called 'works of Reason' are those aspects of the visible world, especially of the heavens, that show a rational and intelligible plan. By contrast, those things that are generated through Necessity seem to result from the sort of mechanical causation which Socrates in the *Phaedo* criticises as unintelligible in itself. Subsequently in the *Timaeus* (45a–47e, 69a ff.), Timaeus tries to reconcile these contrasts by subordinating one to the other. For instance, vision can be explained in purely mechanistic terms as a product of Necessity but it becomes truly intelligible only when we explain it in terms of its rational | purpose. It is interesting to note that Plato here anticipates the teleological perspective of Aristotle's *Physics*.[14] [425]

The Unique Masterwork of the Demiurge as Craftsman [426]

Timaeus begins the first movement of his discourse (29d–47e) by trying to specify the primary reason (ἀιτία) for an ordered universe. Since he is talking about the order of a *constructed* world, its first cause must be the Architect who, being good and lacking in envy, desires that all generated things should be as close to perfection as possible. This is the supreme principle (κυριωτάτη) of generation and of world order.[15] Having posited this principle of order. Timaeus argues for the presence of 'soul' (ψυχή) in the visible Cosmos by appealing to the ethos of a good craftsman namely, that it is never right (θέμις) for him to do anything but what is best (τὸ κάλλιστον). Such an appeal to what is lawful is a typically Greek way of thinking about the universe but the emphasis on craftsmanship seems to be new.[16] Given these assumptions about the good Architect, the argument may be summarised as follows: (1) visible things with reason are better than those without it; (2) but reason cannot

[14] But, if this is the case, one might be legitimately puzzled as to why Aristotle does not acknowledge Plato as having already discovered the sort of causality called 'that-for-the-sake-of-which' (τὸ οὗ ἕνεκα) (cf. *Met*. I). Perhaps the reason is that he does not accept Plato's mathematical cosmology as a genuinely teleological world-view.

[15] W.J. Prior, (1985: 87–126) sees Plato's introduction of the Demiurge as a response to the objections of the *Parmenides* against the causality of Forms with reference to the world of appearances.

[16] For instance, we find a striking antecedent for the appeal to lawfulness in Parmenides who claims that Being cannot be unlimited (Fr. 8.32). Thus, by invoking the principle of lawfulness, the *Timaeus* remains within the Parmenidean tradition, since even Parmenides himself seems to have ventured upon the confused Way of Seeming. I think that it is against the background of such a tradition that we should understand Plato's insistence upon his account of the sensible world being a likely story, though still the most plausible among competing accounts.

belong to anything without soul; (3) thus the good Architect constructed reason within soul and soul within the body, since he constituted the whole universe to be the best and the most beautiful. Consequently, (4) the visible cosmos is generated as a living creature endowed with soul and reason.

Yet if this cosmos is to be the best and the most beautiful, it is necessary for the good Architect to have fixed his gaze on some eternal model. This archetype is none other than the Living Creature (τὸ ζῷον) of which all other ideal living creatures are parts, individually and generically. In fact, Timaeus draws an analogy between the way in which the archetypal Living Creature contains in itself all the intelligible living things (τὰ νοητὰ ζῶα πάντα) and the way in which this Cosmos contains us and all the other visible living creatures. Once again, we find here the familiar ontological distinction between the intelligible and sensible realms, together with the new assertion that the part-whole relationship is similar in both realms.[17] According to the mythical account of Timaeus, the reason for this similarity is that 'the god' (ὁ θεός) used the intelligible Living Creature as a model in order to make the visible cosmos as complete as possible. Hence this divine craftsman constructed it as a single and visible living creature that embraces within itself all the living creatures which are naturally akin to it.

It we were to translate this mythical account into more familiar Platonic terms, we might say that the interrelationship between living forms in the whole visible cosmos is a copy of the relationship between intelligible forms in the realm of Reason. As we may recall from the *Republic* (508a–509c), Plato often asserts that this intelligible world has its own comprehensive unity under the form of the Good. Since the *Timaeus* describes this archetypal world in terms of a Living Creature, we have here the beginnings of an argument for the organic unity of the visible world that imitates it. But Timaeus goes even further by claiming that the visible Heaven (οὐρανὸν) is unique and not multiple or indefinite in number.[18] Plato's argument in the

[17] R. Mohr (1985: 9–52) gives a detailed analysis of this relationship; see also W.J. Prior, 1985, ch. 3.

[18] Here he appears to be consciously opposing the Atomists who held that there is an indefinite number of worlds within a single universe. This well-known position of Leucippus and Democritus can be inferred from their assertion about an infinite void that is partly occupied by an unlimited number of atoms in motion. Given this assumption, it is probable that world-forming vortices will arise in many different places. But if our world is finite and there is an unlimited void outside its boundaries, why shouldn't innumerable worlds be formed out of the material scattered throughout that void? Both Plato and Aristotle, however, denied the existence of an infinite void in which there could be found any material left over after the generation of our visible world.

Timaeus for the uniqueness of this world is based on the claim that its eternal archetype is unique.[19] The latter is held to be unique because that which embraces all intelligible living creatures cannot be one of a pair. If it were then there would have to be yet another unified Living Creature embracing these two which would merely be parts of it. So the | conclusion is that our [427] visible Cosmos may be truly described as a single copy of this unique Living Creature.[20]

This argument for the uniqueness of the original model of the world is similar to Plato's argument in *Republic* X (597b–e) for the uniqueness of the Form of the bed. In that argument, however, 'the god' appears to be the maker of the real bed, which is a unique Form. But in the *Timaeus* there is no suggestion that the good Architect is the maker of the eternal Living Creature, which serves as the unique model for the visible universe. Timaeus concludes his argument by saying that the Maker of the Cosmos generated a unique visible universe in order that this living creature might closely resemble the complete Living Creature in respect of its uniqueness. This suggests that the eternal model is independent of the Maker and that it dictates his ordering of the visible universe. The empirical analogy is with the craftsman who has such a mastery of his craft and of its relevant material that he executes a masterwork in one attempt. Behind this whole argument for a unique universe lies the implicit assumption that a master craftsman needs only one try in order to make a perfect sensible copy of an intelligible paradigm.

III. *The Mathematical Ordering of the World Body*

In considering the character of this generated cosmos, Timaeus argues that whatever has been generated must be of bodily form, | namely visible (ὁρατὸν) [428] and tangible (ἁπτόν). The basis for this initial claim would appear to be the original guiding distinction between the realms of Being and Becoming. Since generated things are said to be grasped by opinion with the help of sense perception, it follows that they must have the appropriate bodily form that

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[19] But, as Aristotle objected in *De Caelo* I, 10–12, if something is a copy of an archetype then it cannot be unique in principle and the best we can hope to establish is that it is unique in fact. However, Plato's whole argument seems to be grounded on the assumption that a master craftsman will only need one attempt to make a perfect product. This is where the appeal to piety plays an argumentative role.

[20] There has been some doubt among scholars about the legitimacy of this argument of the uniqueness of the universe; cf. D. Keyt 1971: 230–235; R. Parry 1979: 1–10; R. Patterson 1981: 105–119. In defence of the argument see R. Mohr 1985, ch. 1, and W.J. Prior 1985, ch. 3.

would make them perceptible in some way. On this basis. Timaeus argues that nothing can be visible without fire, nor tangible without something solid. But (the argument goes on) it is not possible to put the two elements together without a third to serve as a bond (δεσμός) between them. And the best (κάλλιστος) bond would be that which combines with the elements it binds to make a unity in the fullest sense. For Timaeus, this sort of unity is most perfectly achieved by the very nature of proportion.[21]

Once again, considerations of beauty and perfection in the visible cosmos are linked with mathematical proportion, which is the unifying bond for the elements. Significantly enough, Timaeus chooses an example from arithmetic to illustrate the complex unity of proportion. Thus he is here giving an argument that was typical of the whole Pythagorean tradition in which the theory of proportion for rational numbers was first developed in connection with musical harmony.[22] Furthermore, the example used clearly refers to the most perfect type of proportion, namely, continuous geometrical proportion. Commentators like Proclus (*in Tim.*, ad loc) have confirmed that Plato is here speaking only of this kind of proportion, which was generally considered to be primary and best. All of its terms are interchangeable in the sense that we may take these numbers in whatever order we please without destroying the proportion. For instance, we may take them in the order given (i.e. 2:4 :: 4:8) or we may reverse the order (8:4 :: 4:2) or we may completely interchange the order (4:8 :: 2:4 or 4:2 :: 8:4) without losing that equality of ratios between numbers which was constitutive of the original order. Possibly it was the unity and perfection of such continuous proportions that inspired Pythagoreans like Philolaus to seek the order of the visible cosmos in concrete numbers and their relations.

But what is the relevance of the Pythagorean distinction between solid and plane numbers to the question about the nature of the bond between fire and earth in the construction of the universe? Timaeus gives a hint when he argues that if the body of the whole Cosmos had been a plane, then one middle (μεσότης) would have been sufficient but, since it is a solid, two means are needed (*Tim.* 32a–b). He explains that what brings two solids into a unity is never one middle but two. This argument makes little sense until we recognise its dependence on the purely mathematical point that between

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[21] *Tim.* 31c4–5: τοῦτο δὲ πέφυκεν ἀναλογία κάλλιστα ἀποτελεῖν. Proclus (*In Eucl.* 22. 18–22) seems to have such passages in mind when he explains the value of mathematics for knowledge of the physical universe.

[22] Cf. Burkert 1962, Szabo 1978, and van der Waerden 1954, for the relationship between music and the early theory of proportion.

two 'solid' numbers (e.g. 8 and 27) one cannot insert a single geometrical mean that would be a rational number.[23] But one can insert two geometrical means (e.g. 12 and 18) to make a continuous geometrical proportion (e.g. 8:12 = 18:27).

Yet the argument itself is not quite transparent.[24] The clue lies with the two Greek words, ἐπίπεδον and βάθος, which are used by Timaeus to describe the alternative possibilities for the dimensions of the body of the Cosmos, namely, it is either a plane surface or it has depth. These words suggest the analogy with square and cubic numbers, upon which the plausibility of the argument rests. It would appear that such analogical arguments were typical of the Pythagoreans, if we are to judge from examples like the equation of Justice with the number 4 because of the latter's reciprocity. Plato lifts the argument above this simple-minded level by suggesting | that the Demiurge [429]
who constructed the visible and tangible heaven had good mathematical reasons for placing water and air as means between earth and fire, i.e. that he tried to place them in the same proportion to one another[25] in order to achieve unity and perfection in the visible Cosmos. Here we catch a glimpse of the older meaning of proportion as equality of ratio: fire is to air as air is to water, and water is to earth as air is to water (i.e. fire : air :: air : water :: water : earth). Such continuous proportion plays a central role in Timaeus' account of how the good Architect used the four elements to construct the body of the visible cosmos as a harmonious whole.

Physical Reasons for the Unity of the Cosmos

One of the main reasons why Timaeus insists upon the proportion and harmony between the four elements of the world body is that this constitutes friendship (φιλία) which in turn guarantees the unity and indissolubility of the cosmos. This is implicitly contrasted with the old Ionian belief that the world goes through recurrent periods of order and disorder. In

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[23] Strictly speaking, this is not true if the 'cubic' numbers also turn out to be 'square' (e.g. 64 and 729).

[24] Perhaps it is an unintended consequence of the analogy with numerical proportion that the two means (e.g. 12 and 18 in the case of extremes like 8 and 27) will not themselves be 'cubic' numbers and so can hardly correspond to 'solid' bodies like air and water, which are held to serve as physical bonds between the extremes of earth and fire. This difficulty is nowhere adverted to by Plato, so perhaps he was not aware of it; yet it is so elementary that one can hardly credit such inadvertence.

[25] *Tim*. 32b6–7; cf. also 56c.

the system of Empedocles, for instance, the contrary principles of Love (φιλότης) and Strife (νεῖκος) constitute, in turn, periods of unity and of dissolution for the cosmos when they are in the ascendant. By referring to the Empedoclean principle of unity, Plato underlines the absence of a principle of dissolution from the body of the Cosmos that has been structured according to mathematical proportions.[26] Another reason why there is no tendency towards its destruction is that the good Architect[27] has used up all of the material available, so that not a single part or power (δύναμις) of the four elements is left outside (ἔξωθεν) (*Tim.* 32c6 ff.). Of course, this presupposes a limited supply of material and so Plato is implicitly rejecting the Atomists' conception of an unlimited quantity of matter that is scattered about in an infinite void.

[430] In fact, we notice many similarities with the Parmenidean conception of Being. For instance, Timaeus says that the Demiurge gave to the visible Cosmos a shape which is fitting (πρέπον) and akin (ξυγγενές) to its nature. Therefore the good Architect gave the visible universe a spherical form, σφαιροειδές, since this is the most complete (τελεώτατον) and most uniform (ὁμοιότατον) of all shapes. Furthermore, he judged uniformity to be immeasurably better (κάλλιον) than lack of uniformity. So considerations of beauty and order dictate that the Cosmos be constructed as a sphere because it is 'equidistant in all directions from the centre to the extremities'. This feature of the sphere gives it a uniformity and perfection that made it greatly revered by Greek thinkers as the 'cosmic' figure. In fact, in a well-known fragment from his 'Way of Truth', Parmenides describes Being as 'bounded on every side, like the bulk of a well-rounded sphere, from the centre equally balanced in every direction'.[28] There are unmistakeable echoes of this in Timaeus' description of the visible Cosmos, which also emphasises the completeness and perfection associated with a spherical shape. In addition, the uniformity or 'well-roundedness' of the sphere is made to depend in both cases on the fact that its boundary is equidistant in all directions from its centre. Thus, as a copy of eternal Being, the Cosmos is constructed as perfectly as possible by being given a spherical shape.

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[26] Skemp (1942: 63) finds the same implicit references but thinks that φιλία here may be a Pythagorean refinement on the Empedoclean moving power. In addition, he finds a close parallel between the function of νεῖκος in the Empedoclean cosmic system and that of ἀνάγκη in the *Timaeus*.

[27] Against the old poetic theme of divine envy, Plato insists that the Demiurge remains always well disposed towards the general universe and that he will never choose to dissolve it, although it remains in his power to do so (*Tim.* 29e. 41a–b).

[28] Fr. 8, 42–43, trans. Kirk & Raven.

Furthermore, like the well-rounded sphere of Parmenides, the body of the universe is said to be perfectly smooth round about on the outside. First, Timaeus insists that the Cosmos has no need of eyes, since there was nothing visible (ὁρατὸν) left outside. This statement makes more sense when we recall that visibility involves the bodily elements, none of which were left outside the unique universe constructed by the good Architect. Therefore, since there was nothing visible outside, there was no need for the universe to have eyes.[29] Timaeus gives a similar argument for the absence of hearing and respiration in the body of the cosmos. In addition since nothing comes in from outside nor does anything go out from inside, he argues that the cosmos has no need of organs for receiving food or for disposing of waste. Instead, he says, it was designed to feed itself on its own waste and to act and be acted upon entirely by itself and within itself (*Tim.* 33d1). Thus, according to the mythical account of Timaeus, the good Architect constructed a completely self-sufficient entity (αὔταρκες ὂν), because he regarded this state as being better than one of dependency. In fact, such a state of being was traditionally seen as being divine and we can see this view reflected in Aristotle's description of the Prime Mover in *Metaphysics* XII. It was a typically Greek assumption, of course, that self-sufficiency (αὐταρκία) is naturally superior to the state of dependency (προσδεές).[30] Thus it is not surprising that Timaeus ascribes the superior character of self-sufficiency to the visible cosmos which he claims to be made in the exact image of an eternal model.

Since the rationale behind the whole description of the world-body given by Timaeus is now clear, we may conclude the analysis with a few general remarks. Obviously Plato attaches a high value to the static consistency and self-identity of Reason, in contrast to the wandering multiplicity of Opinion. We may recall that in the Platonic dialogues Socrates insists on saying the same thing about the same things, in opposition to the more popular encyclopaedic | approach of the Sophists. Against this background we can [431] understand why, in the *Timaeus*, spherical motion is held to be appropriate for a world-body that is itself rationally constructed to exclude the irrational

[29] This is the sort of functional argument which Aristotle also uses extensively under the general principle that 'Nature makes nothing in vain.' *De Caelo* II, 2, 291b14: οὐδὲν ἀλόγως οὐδὲ μάτην. See also *De Caelo* I, 4, 271a33; *De Part. An.* II, 13, 658a9; III, 1, 661b24; *De Gen. An.* II, 5, 741b5; II, 6, 744a36; *Pol.* I, 8, 1256b21.

[30] In Greek literature from Homer onwards, self-sufficiency is consistently identified with the state of freedom (ἐλευθερία) of the 'worthy-man' (καλοκἀγαθός), whereas dependency is seen as the state of being in need that is characteristic of the slave (δοῦλος); cf. *LSJ*. 278, 447, 532, 1505–1506.

motions (up/down, forward/backward, right/left) as far as possible. The description of the rational world-soul, however, shows that the good Architect has not entirely succeeded in excluding these wandering motions from the visible Cosmos and its elements (cf. *Tim.* 52d ff.). Yet, according to Timaeus, he does manage to exclude them from the motion of the Cosmos as a whole. Perhaps this follows directly from the claim that there is nothing outside the Cosmos; so that neither can there be any of those directions in which the Cosmos could move. This argument assumes that these directions are relative to the structure of the visible universe and hence can have no reference to anything outside of it (cf. *Tim.* 62c ff.).

IV. *The Numerical Structure of the World-Soul*

According to the foregoing account, the body of the generated cosmos was made smooth, uniform, equidistant from its centre—a complete body compounded of perfect bodies by the divine Architect who wanted to make the visible universe as divine as possible (*Tim.* 34b1 ff.). Presumably, divinity is also an essential aspect of the soul which he placed in the middle (τὸ μέσον) and stretched throughout the whole (διὰ παντός), so that the body was surrounded on the outside (ἔξωθεν) by soul. But Timaeus also insists that the body of the universe is neither prior in birth (γενέσει) nor in excellence (ἀρετῇ) to the soul, since this would invert the order of cosmic rule.[31] The function of the soul is to be the mistress and ruler of the body and, thereby, to serve as a principle of limit on a cosmic scale. Yet, the construction of the world-soul by the Demiurge must be done either in a different manner or with different materials from those of the world-body, otherwise the two would be identical. These materials seem to be a strange mixture of the Same and of the Different compounded by Being, all of which are intermediate mixtures of that which is indivisible and eternal and of that which is generated and divisible. Hence the world-soul is constructed out of a kind of material that is intermediate
[432] between the realms of Being and Becoming, which were distinguished at | the beginning of the dialogue.[32] We find no further hint in this obscure passage as

[31] This emphasis upon the proper order of priority among beings is an aspect of the Platonic tradition which Aristotle takes up and develops even while coming to very different conclusions; see Cleary 1988.

[32] Cornford (1937, ad loc.) gives a very clear analysis of the two-stage mixture which seems to be involved in generating the material of world-soul. Prior (1985: 99) notes that this distinction between two kinds of Being, Sameness, and Difference is unparalleled elsewhere in Plato and

to what kind of material this might be, though Timaeus does tell us that the Demiurge blended it from intermediate Sameness and Difference to make one form (μίαν ἰδέαν). He also tells us that it was difficult to mix Sameness and Difference, on account of the nature of the latter, so that the god had to enlist the aid of Being (οὐσία).[33]

Having listed the three constituents of the world-soul, Timaeus describes how the mixture is divided by the Demiurge. The odd thing here is that what we would regard as abstractions (e.g. Sameness. Difference, Being) are treated like plastic materials that can be used in the formation of the world-soul.[34] But I attach more significance to the fact that the resulting mixture is divided according to the following series of numbers: 1, 2, 3, 4, 8, 9, 27. This series is composed of two interlocking series of doubles and triples, respectively, i.e. 1. 2, 4, 8, and 1, 3, 9, 27. Interestingly, however, Timaeus calls them double and triple intervals (διαστήματα) and talks about finding two means (μεσότητας) for each interval. It is clear that he is talking about the harmonic and arithmetical means between the numbers in each series, though there is a strong hint of musical intervals in the traditional word διάστημα.[35] This hint is important to keep in mind for understanding the results of inserting harmonic and arithmetical means between the numbers in each class of intervals. For the so-called double interval we get the following series: 1, 4/3, 3/2, 2, 8/3, 3, 4, 16/3,

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thus he attributes it to Plato's recognition that Forms are non-spatial entities, so that physical objects must have a different sort of Being, Sameness, and Difference.

[33] Some commentators (like Cornford) think that these three constituents of the world-soul correspond to the so-called greatest kinds of the *Sophist* (244–245), while others (like Owen) think that they can be found already in the *Republic*. But the important issue is what significance should be attached to such constituents. Shorey (1933) argues that the soul must be constituted of the three highest kinds because it must recognise them everywhere; cf. *De Anima* 404b16 ff. But the same argument could be made for all the forms which the soul must recognise and, obviously, they are not all intended here. At any rate, it is not clear that the world-soul is subject to the same epistemological conditions as the human soul. After the formation of the world-body, its soul may be presumed to perceive itself, the Forms, and the world body; while passing judgments of existence, sameness, and difference about all three.

[34] Taylor (1928: 106 ff.) notes that this whole passage was a source of disagreement among early Academicians, such as Xenocrates and Crantor. While the former defined soul as a self-moving number (ἀριθμὸν κινοῦνθ' ἑαυτόν), Crantor simply regarded the soul as being aware of things with reference to motion. But, according to Plutarch (1013a: περὶ τῆς ἐν Τιμαίῳ ψυχογονίας), both refused to take literally Plato's account of the composition of soul which they regarded as being made for the sake of inquiry.

[35] A. Szabo (1978: 99 ff.) claims that musical intervals expressed as ratios between numbers were called διαστήματα (i.e. distances between two points) in the most ancient Pythagorean theory of music. Since a διάστημα really had two end-points that were assigned numbers, Plato is close to the original meaning of the word. It is also relevant to note that this is the term reportedly used by Speusippus to cover all material principles; cf. Tarán 1981: 313–314.

6, 8. And the insertion of means in the triple interval gives us the following: 1, 3/2, 2, 3, 9/2, 6, 9, 27/2, 18, 27. There is considerable overlap between the two series and, in fact, they can be combined to form one complete series as follows: 1, 4/3, 3/2, 2, 8/3, 3, 4, 9/2, 16/3, 6, 8, 9, 27/2, 18, 27. This series can be represented in musical intervals but it really arises from considerations other than those of musical harmony. For instance, the arbitrary termination of the series with 27 is dictated by the fact that it is the cube of 3. In principle, the harmonic series could go on indefinitely, so Plato may be thinking of the three dimensions when he imposes such a limit.

Hence, in order that the soul be able to grasp all the things that exist, it must be compounded in a harmony up to the solid numbers with two means. We may recall that, in the construction of the world-body, water and air were inserted as geometrical means between fire and earth, so that the greatest unity and perfection would belong to the body of the visible cosmos. Similar conditions hold for the harmonic intervals to which Timaeus refers in giving his account of the generation of the world-soul. If he simply wanted a musical scale, it would have been much easier for him to start with the traditional Pythagorean tetractys (1, 2, 3, 4) which yields the ratios forming the perfect consonances, i.e. 2:1 (octave), 4:3 (fourth), 3:2 (fifth). Of course, these ratios are inserted as means in some of the original double and triple intervals, yet they provide only a small part of the whole resulting series. Thus Timaeus has constructed a section of the diatonic scale, whose range (from 1 to 27) is fixed by considerations extraneous to music.

Timaeus continues to speak (*Tim.* 36b6 ff.) in a very concrete fashion about some kind of soul stuff that the Demiurge splits lengthwise into two strips. In order to grasp how the circles of the Same and the Different feature here, we can imagine two such strips being laid crosswise and then being bent around to form two circles interlocking at oblique angles opposite the initial point of
[433] intersection.[36] The outer circle is designated the characteristic | movement of the Same and it represents the celestial equator around which the whole Cosmic sphere 'turns to the right' (ἐπὶ δεξιά), i.e. from East to West.[37] By contrast, the inner circle represents the movement of the Different as being

[36] Timaeus explicitly compares this crosswise structure to the formation of the Greek letter X, which suggests (contrary to Guthrie's translations) that the angle of intersection is not a right angle but is an acute angle (e.g. 24 degrees) such as Greek astronomers discovered between the plane of the ecliptic and that of the celestial equator; cf. van der Waerden 1954.

[37] Dicks (1970: 121) claims that when Timaeus makes the circle of the Same revolve to the right, this is not with reference to earthly directions but in deference to the Pythagorean tradition that the right is superior to the left. This seems correct in view of the later (*Tim.* 62d ff.) denial of such absolute directions in the universe.

'to the left along the diagonal' (κατὰ διάμετρον ἐπ' ἀριστερά, 36c9). Here I think we must take the inner circle to correspond to the plane of the Zodiac which inclines to the plane of the celestial equator just as the diagonal of a rectangle to its side. If we now imagine a rectangle to be inserted between the summer and winter Tropics, we can see why Timaeus describes the motion of the Different as being 'along the diagonal' from West to East. It should also enable us to see why the movement of the Same is said to be in the opposite direction 'along the side' (κατὰ πλευρὰν). Thus, in general, we can associate the circle of the Different with the Ecliptic, which is a great circle touching the summer Tropic at a point in Cancer and the winter | Tropic at a point [434] in Capricorn. But it might be better to think of the Zodiac as a broad band because the circle of the Different is also said to be a strip of soul stuff that is subsequently divided into seven unequal circles.

According to Timaeus, the Demiurge gave 'supremacy' (κράτος) to the uniform movement of the Same and left it single and undivided. This seems consistent with the principles of order which the divine Craftsman has followed so far in his work, although there is also the apparently disordered motion of the planets to be explained. In this regard, it is timely to recall the tradition that Plato set this as a leading task for the astronomers of the Academy.[38] But perhaps we should take this passage as a quasi-Pythagorean attempt to 'save the phenomena' of planetary motion in terms of concentric circles.[39] Of course, it would make for even greater harmony if these circles were in proportion to each other according to harmonic intervals. But this is exactly how Timaeus describes the division of the circle of the Different into seven unequal circles 'according to each of the intervals of the double and triple intervals'.[40] Now we can see the real purpose and significance of this previous list of double (1, 2, 4, 8) and triple (1, 3, 9, 27) intervals with their respective harmonic and arithmetical means. When we link each of the

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[38] Mittelstrass (1962: 149–159) casts doubt on this tradition by arguing that Eudoxus, as a fully-fledged astronomer, was more likely to have influenced Plato than vice versa.

[39] Burkert (1962: 310–311) claims that Pythagoreans like Philolaus broke from the prevailing view of Anaximander and Parmenides by grouping the planets with the sun and the moon rather than with the stars. Thus he argues that Plato is following this Pythagorean tradition when he talks about the seven circles of the Zodiac associated with these heavenly bodies; cf. *Tim*. 36d, 38c–d. Since the *Timaeus* shows no trace of the Eudoxean theory of homocentric spheres, perhaps Mittelstrass (1962) is right about this being a later influence on Plato in *Laws* X.

[40] *Tim*. 36d3–4: κατὰ τὴν τοῦ διπλασίου καὶ τριπλασίου διάστασιν ἑκαστην. It must have been passages like this which inspired Kepler to explain the relative positions of the planets ın terms of the pure mathematical relations between inscribed and circumscribed circles for the five perfect solids; cf. *Mysterium Cosmographicum* (1596).

planets with one of these numbers, the intended mathematical ordering of the universe begins to appear and becomes fully evident with their relative speeds being made proportional to one another (*Tim*. 36d).

The motion of the outermost sphere corresponds to the equator of the sphere of the fixed stars and it represents the movement of the Same, i.e. the revolution of the sphere as a whole in uniform motion from East to West which involves every star in the heavens and all the contents of the universe. This revolution has 'supremacy' inasmuch as it carries round with it all the contents of the sphere, including the planets, even though these have opposite motions of their own. Of course, the Earth at the centre would also participate in the movement of the Same, unless this were counteracted by its own unique motion which can only be due to soul.[41] Since self-movement was taken by the Greeks to be the primary characteristic of soul, it comes as no surprise to find Timaeus attributing a soul to each one of the planets, as well as to Earth and to the universe as a whole. Considered as a motion of the world-soul, the movement of the Same may be interpreted as the supremacy of Reason which regulates all its other motions, including its judgments and desires.

By contrast, the motion of the Different is distributed among all the seven orbits where it actually finds embodiment. This means that all seven planets share a motion that is contrary in direction to that of the fixed stars, whose movement (of the Same) they also share by virtue of its supremacy. Thus, every planet has a composite motion of at least two different movements, without counting a possible motion due to its own unique soul.[42] Here we can discern the bare outline of a possible explanation for complex motions of the planets in terms of compounded circular movements that are simple and uniform in themselves. For instance, Timaeus says later (38d) that the Sun, Venus, and Mercury move in circles of equivalent speed, even though the latter two have a 'power' (δύναμις) contrary to the Sun. From the context it seems that this contrary power is an *ad hoc* device to explain

[41] It is difficult to decide whether the Earth is given its own unique motion, but see *Tim*. 40b–c. There is a long-standing (and unresolved) debate among commentators about the meanings of εἱλλομένην here, which Aristotle (*De Caelo* 293b30) took to imply that the earth itself had a characteristic rotation. The problem is well rehearsed by Guthrie (1939: 85) who suggests that the earth is thought to remain at rest by having an equal and opposite motion to that of the whole universe.

[42] Timaeus describes the composite motion of the sun as a 'spiral twist' (στρέφουσα ἕλικα, *Tim*. 39a6–b1). Vlastos (1975: 55–57) gives a convincing geometrical reconstruction of this motion, showing that it can be explained as the combination of two rational circular motions. He admits, however, that this does not explain the 'wandering' motion of the planets, though he denies that Plato took the easy way out by attributing this to their particular souls.

why Venus and Mercury sometimes overtake and sometimes fall behind the Sun.[43] Presumably, the same kind of vital power could be attributed to the other | planets in order to explain the phenomenon of retrogradation. In the [435]
Timaeus, however, Plato leaves unexplained this third motion (besides the movements of the Same and of Difference) which contributes to the complex motion of the planets. Since they are divine living creatures with their own souls, by definition they have the power of self-motion.[44] Therefore, we might conjecture that it is the self-motion of the planets which enables them to counteract or reinforce the movements of the Same and the Different.

All of this is quite consistent with the narrative which tells of the visible universe being modelled after the eternal Living Creature. It is clear that the constructed Cosmos will imitate this model better if each of its parts has soul, which is the principle of life. Thus, after completing his account of the fabrication of the world-soul, Timaeus emphasises again that it permeates the body of the universe from the centre to its extremities. According to his account, it is this embodied soul of the universe, revolving within itself, which 'made a divine beginning of ceaseless and intelligent life for all time'.[45] In contrast to the visible body of the cosmos, | the soul is invisible. Furthermore, [436]
partaking of reason (λογισμός) and harmony (ἁρμονία), it is the best among all those intelligible and everlasting things which are generated.

From the ontological point of view, the soul is a compounded blend of the natures of the Same and of the Different and of Being. In addition, it has been divided and bound together in due proportion (ἀνὰ λόγον) and it revolves back upon itself (*Tim.* 37a5–6). Therefore, according to Timaeus, whenever the soul 'touches' (ἐφάπτηται) anything whose Being is dispersed (i.e. participating in Difference) or whose Being is undivided (i.e. having Sameness), she is set in motion all through herself and tells in what way (and how, and in what sense, and when) something is the same or different with respect to something else. For my purpose here, it is sufficient to note that the epistemological principle of 'like knows like' is being correlated with the ontological structure of soul.

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[43] Burkert (1962: 323–324) argues convincingly that this passage does not refer either to the theories of homocentric spheres or of epicycles, though he thinks that Plato later learned and accepted the Eudoxean theory; cf. *Laws* 897d ff.

[44] Against this, Tom Robinson (1970 & 1987: 103–119) claims that the definition of soul found in the *Phaedrus* cannot be assumed to apply to the concept of soul in the *Timaeus*. Mohr (1985) accepts Robinson's argument and hence claims that the world-soul in the *Timaeus* functions as a maintainer of order against the natural tendency of the corporeal to be chaotic.

[45] *Tim.* 36e4–6: αὐτή τε ἐν αὑτῇ στρεφομένη θείαν ἀρχὴν ἤρξατο ἀπαύστου καὶ ἔμφρονος βίου πρὸς τὸν ξύμπαντα χρόνον.

Furthermore, since soul has an intermediate status between the realms of Being and Becoming, it can come into contact with entities belonging to both realms. Thus, according to the logic of touching as knowing, the character of the object touched by the soul will determine the character of the knowledge that is obtained. For example, whenever the soul is in contact with the sensible (τὸ αἰσθητὸν) or with 'the circle of the Different' (ὁ τοῦ θατέρου κύκλος), there are generated opinions and beliefs which are firm and true (*Tim.* 37b8–9). By contrast, when the soul touches 'the rational' (τὸ λογιστικόν) or the 'circle of the Same' (ὁ τοῦ ταὐτοῦ κύκλος) what must be accomplished is rational understanding and knowledge (*Tim.* 37c2–3). This appears to reiterate the initial distinction made by Timaeus (*Tim.* 27d ff.) between the realms of Being and Becoming, together with the different ways in which they are grasped by the soul. But here we find the distinction between belief and knowledge being grounded in the ontological character of the visible cosmos. Opinion is different from rational knowledge, for instance, because the sensible universe is an inexact copy of the eternal Living Creature that was used as a model by the Demiurge. But, on account of its intermediate place, the soul is able to make contact with eternal and intelligible Being as well as with sensible and generated Becoming. Of course, the precision and certainty of cognition differs according to the ontological character of the object, but the point is that there could not be any cognition without the soul. Hence, along with being the principle of self-motion, soul possesses a nature compounded of intermediate Sameness, Difference, and Being, such that it is capable of grasping anything constituted from these kinds. But the *Sophist* dialogue shows that the world of Forms is characterised by having these categories as 'highest genera'. Therefore, through the principle that like is known by like, we can see the ontological ground for the soul's capacity to grasp the Forms in the realm of eternal Being. Furthermore, the same principle will apply to the soul's ability to have true beliefs about the changing realm of appearances, since these images participate imperfectly in the Forms. Thus we can now begin to see the deeper implications of the principle of correlation between ontology and epistemology.

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V. *Reason and Necessity*

At 40d Timaeus declares that he has given a sufficient (ἱκανῶς) account of the nature of the visible and generated gods, i.e. the heavenly bodies and their motions. In an ironic manner, he excuses himself from giving an account of the origin of other (hidden) divinities on the plea that he accepts the

accounts given by the poets and theologians, even though their statements are neither probable (εἰκότων) nor necessary demonstrations (ἀναγκαίων ἀποδείξεων). In this light, I think that his summary of the sort of mythological stories about Cronos and Zeus which can be found in Hesiod's *Theogony*, for instance, should be taken as Plato's subtle criticism of all such accounts. This criticism is more crudely reflected in Aristotle's dismissive attitude towards these 'theologians' in *Metaphysics* I, 3, 983b25–984a2, where he accuses them of talking to themselves. By contrast, even when Plato himself uses mythological modes of narrative, he insists that he is giving a likely account. For example, Timaeus' account of the address of the Demiurge to the lesser gods looks mythological but I think that it tries to give a plausible account of certain phenomena such as the apparent difference between heavenly and sublunary bodies with respect to generation and corruption.

This can be shown by means of a summary of the principal points in this speech (41a ff.). For instance, the declaration of the Demiurge that the generated gods cannot be destroyed except by his permission seems to be a mythical explanation for the everlasting appearance of the heavenly bodies. Secondly, the generated gods are charged with the task of generating three mortal kinds (creatures of air, water, and earth), so that the whole heaven may be perfected (τέλειος). This seems to conflict with what Timaeus said earlier (30c–d) about the Demiurge being the maker of the universe as a perfect living creature, which contains within itself all the living creatures that are by nature akin to itself (κατὰ φύσιν ξυγγενῆ ζῶα). But the final qualification here shows a way out of the difficulty because it only commits the Demiurge to generating living beings that are incorruptible like the universe itself. This is confirmed when he explains that he cannot be responsible for generating mortal kinds, otherwise they would be immortals like the lesser gods. However, he does undertake (41c) to produce the immortal part of mortals which is called divine (θεῖον λεγόμενον) and to deliver it to the lesser gods who will embody it in what they have produced. I think this represents Plato's attempt to give a plausible mythical account of the immortality of the human soul for which he argued more logically in the *Phaedo*.

We can see this clearly from the mythological description (41d ff.) given by Timaeus of the production by the Demiurge of the immortal part of the human soul from the residue of the material that is mixed and blended in the world-soul. Although its material is inferior in purity, the human intellect has a similar structure to that of the world-soul and, according to the epistemological principle of 'like to like', can understand its intelligible structure. Timaeus also describes how the Demiurge divides this soul-material | into parts equal in number to the stars that are assigned to each [438]

of them like a chariot (ὡς ὄχημα) for the mythological journey of discovery during which they are shown the nature of the universe and informed of the laws of destiny. If we compare this with a similar mythological description in the *Phaedrus* of prenatal experience of the human soul, we may see it as Plato's way of rendering plausible his own theory of recollection. The most important point that emerges from the so-called laws of destiny (νόμους εἱμαρμένους) is that each soul is given an equal chance to decide its own fate by means of the moral choice which it makes during its first incarnation. Whoever lives his life well returns to his native star and enjoys happiness (εὐδαιμονία), whereas anyone who fails to live justly will be caught up in subsequent generations that always involve a degeneration which reflects the character of this previous wickedness. The ostensible purpose (42d) of announcing these laws is that the Demiurge is not held responsible for the future wickedness of any one of these souls that he has produced. Obviously Plato was concerned with the problem of accounting for moral evil, though for him the problem is not so difficult as for the later Christians who believed in an all-powerful creator God.

According to Timaeus' mythical narrative (42e ff.), the lesser gods obey the command of the Demiurge and set about their task of making this mortal living creature (man) in imitation of the World Animal. For that purpose they borrow portions of the four elements and bind them together, though not with the sort of indissoluble bonds that the Demiurge used in producing the heavenly bodies. They bind the revolutions of the immortal soul (handed over by the Demiurge) within such physical bodies, which are typified by a number of different 'rivers' like nutrition and sensation. It is the fate of the soul to be thus bound up with a body whose 'floods' it cannot completely control, though it is never drowned by them. For instance, sensation (αἴσθησις) is described as the tumult produced within each such mortal creature as a result of the collision between its body and external bodies like fire, earth, and water. Timaeus conjectures that these jostling sensations interfere with the revolutions of the soul produced by the Demiurge according to the movements of the Same and the Other. The result is the kind of irrational (ἀλόγως) motion in every direction that we observe in children and in people driven by passion. In our ordinary sensations these disturbances show themselves in perceptual relativity and in the characteristic confusions of left and right, small and great, that belong to this faculty. However, Timaeus (44b–c) does hold out the hope that the soul's movements (the Same and the Other) can gain control over the irrational motions belonging to the body, and that such a rational state can be reinforced by the right educational nurture (ὀρθὴ τροφὴ παιδεύσεως) presumably as envisaged in the *Republic*.

But it is important to take note of the programme which Timaeus (44c–d) rather formally and self-consciously lays out for his subsequent discussion. For example, postponing discussion of the moral virtues, he promises to give a more exact (ἀκριβέστερον) account of the condition of the soul in the body, which is his present topic of discussion. On the other hand, with respect to the prior topics concerning the generation of both the soul and the body, he insists on adhering to the most likely account (μάλιστα εἰκότος). The antithetical structure of the Greek sentence seems to suggest a contrast between two distinct projects in terms of different degrees of precision that one might expect in them.

I think it is fairly clear that Timaeus is continuing with the likely account, [439]
when he describes (44d ff.) the construction of the human body by the lesser gods. Accepting the two divine revolutions of the intellect from the Demiurge, they bound it within a spherical body like that of the universe. Given the inherent wisdom of language, Timaeus finds it appropriate that this body is called the head because it is the most divine (θειότατον) and ruling (δεσποτοῦν) part of the human body. One should take note of the teleological elements to be found even in the rather comical explanation (44e) that the gods connected the rest of the body to the head as its servant, in order that (ἵνα) it should not go rolling over the uneven surface of the earth.[46] Since the body was intended as a chariot (ὄχημα) or as a means of transport (εὐπορίαν) for the head, on account of this (ὅθεν) it acquired length and sprouted four limbs by divine contrivance (θεοῦ μηχανησαμένου) as instruments of transport. The result of this production was that the body could travel through most places, bearing aloft the chamber of our most divine and holy part (θειοτάτου καὶ ἱερωτάτου). Similarly, the superiority in honour and dignity (τιμιώτερον καὶ ἀρχικώτερον) of forward motions is invoked to explain why the limbs are attached to the body in such a way as to facilitate this type of motion.

This hint of teleological explanation and its contrast with explanations in terms of auxiliary causes can be developed further by considering Timaeus' subsequent account (45b ff.) of the construction of the light-bearing eyes (φωσφόρα ὄμματα). According to this mythical account, the gods contrived (ἐμηχανήσαντο) a body from such non-burning fire as gave off a mild light (φῶς ἥμερον), akin to the light of day (οἰκεῖον ἑκάστης ἡμέρας). Here linguistic

[46] Taylor (1928: 275) notes that Timaeus is following Alcmaeon in treating the brain as the centre of the sensorimotor system for the human body. In remarking that 'Timaeus' is having some fun at the expense of Empedocles, Taylor seems to have forgotten that such subtle irony is the work of Plato the artist.

similarity, together with the epistemological principle of like to like, both dictate that the material of the eye be the same as the medium in which it sees. Within this account are some peculiar assumptions about the working of the eye, which were probably introduced to explain such visual activities as focusing and noticing. One of these assumptions is that the eye itself emits a stream of pure fire into the light of day, with the result that they coalesce to form a visual ray which extends from the seen object to the eye. Although the details of this theory of vision are rather obscure, it seems that visual rays are conceived of as homogenous bodies that convey the motions of the external objects back to the eye and into the soul. Thus, when night falls and the kindred fire vanishes, the inner fire goes forth into what is dissimilar (ἀνόμοιον) and becomes quenched because it no longer shares the same nature with the adjoining air. This strange theory (which seems to have been adopted from Empedocles) is criticised by Aristotle (*De Sensu* 437b11 ff.) on the grounds that, if it were correct, visibility should be very bad on cold and wet days.

Yet I am not here concerned with how well this theory saves the phenom-
[440] ena, but rather with its status as an explanation. At *Timaeus* | 46c–d it seems that such physiological explanations are identified as 'auxiliary causes' (συναίτια) which the god uses as assistants (ὑπηρετοῦσα) in reaching (ἀποτελῶν), as far as possible, the form of the best (τὴν τοῦ ἀρίστου ἰδέαν). The language here clearly indicates the inferior status of these mechanical causes in relation to the teleological causes that guide the production of the Demiurge and the lesser gods. The point is also brought out through the critique of the *physiologoi* that Plato puts in the mouth of Timaeus. Instead of treating them as auxiliary causes, these natural philosophers have proposed as the causes (αἴτια) of all things such processes as cooling and heating, solidifying and dissolving, and so on. But, Timaeus objects, these 'causes' cannot involve rational or purposive planning because that is a unique property of invisible soul, and so cannot belong to visible bodies like the four elements. This objection paves the way for a reordering of types of inquiry as follows: one must pursue first the sort of reasons that belong to an intelligent nature, and secondly those causes belonging to the kind of things that are moved by others and move others by necessity (ἐξ ἀνάγκης).

In contrast with the *Phaedo* passage, I think it is noteworthy that here Plato accepts both as types of causes (τὰ τῶν αἰτιῶν γένη), even though he insists on distinguishing those intelligent (μετὰ νοῦ) causes which are producers (δημιουργοὶ) of things fair and good from those causes which are deserted by intelligence (μονωθεῖσαι φρονήσεως) and so always produce accidental and irregular effects. This distinction between causes is now illustrated (46e–47a)

in terms of seeing and light. Timaeus says that his previous discussion of the material structure of the eye dealt only with the auxiliary causes (ξυμμεταίτια) that help it to acquire the power of vision. What remains to be clarified is the most beneficial function (τὸ μέγιστον εἰς ὠφέλειαν ἔργον) for the sake of which the god bestowed eyes on human beings. In spite of his mythical form of speaking, Timaeus is obviously the mouthpiece for Plato himself here when he self-consciously introduces the teleological cause of the human eye. According to 'my account' (κατὰ τὸν ἐμὸν), Timaeus says, vision is the cause of the greatest benefit to us (τῆς μεγίστης ὠφελείας), namely, that none of the present cosmological accounts would ever have been given if man had not seen the heavenly bodies.[47] In fact, he says, the vision of night and day, and of months and years, has produced (μεμηχάνηται) the art of numbers and thereby has given mankind not only the notion of time (χρόνου ἔννοιαν) but also the means of inquiry into the nature of the universe (τῆς τοῦ παντὸς φύσεως). As a result, mankind has procured philosophy as the greatest gift that has ever been bestowed by the divine, and it is precisely this that Timaeus declares (47b) to be the greatest good of eyesight (μέγιστον ἀγαθόν).

Finally, Timaeus completes the circle of explanation by bringing the microcosm (mankind) into correlation with the macrocosm (the whole universe). According to his account (46b ff.), the ultimate purpose of philosophy is found in the myth that the god bestowed vision on us so that we might see the revolutions of Reason (τοῦ νοῦ περίοδους) in the heavens and use them for guiding the revolutions of reasoning within us. Although these latter revolutions are perturbable (τεταραγμένας), they are akin (ξυγγενεῖς) to the imperturbable revolutions of the heavenly bodies and so, through learning (ἐκμαθόντες) and sharing in calculations which are correct by their very nature (λογισμῶν κατὰ φύσιν ὀρθότητος μετασχόντες), we may be able to stabilise the varying revolutions within us by imitating (μιμούμενοι) the absolutely unvarying revolutions of the | god (τὰς τοῦ θεοῦ πάντως ἀπλανεῖς). I think there is no doubt [441]
but that Plato intended this myth to be taken quite seriously, since it provides a cosmological grounding for the education of the philosopher-rulers envisaged in the *Republic*. As evidence for his seriousness, one should note that he makes Timaeus repeat (47c ff.) the same myth for the human voice (φωνή) and hearing (ἀκοή), i.e. that they were bestowed by the gods for the same purpose (ἕνεκα) of developing human rationality. Towards this goal

[47] Thus, through their theoretical activity but not in their theories, the *physiologoi* testify to the presence of a teleological cause in the universe. Such an argument, based on the disparity of *logos* and *ergon*, may reflect the influence of Socrates on Plato's thought.

it is claimed that speech (λόγος) has made the greatest contribution, presumably because it facilitated dialectical conversation which is the medium for philosophy. In addition, music was bestowed on mankind by the gods for the sake of harmony (ἕνεκα ἁρμονίας). But harmony also involves motions that are akin to the motions within the human soul, and so it is achieved only by those who make intelligent use of music for ordering the soul, and not for irrational pleasure (ἡδονὴν ἄλογον). All of this renders more intelligible what Plato says in the *Republic* about the use of poetry and music for the development of rationality in his ideal *polis*. However, it also implies that there is an irrational element to be reckoned with both in mankind and in the universe itself.

Conclusion

In this paper, I have tried to show that the 'Socratic' demand for teleological explanation in the *Phaedo* is satisfied in the *Timaeus* through the myth of the Demiurge and his mathematical plan for ordering the world according to what is best. Here the request for an explanation akin to that given for human action is fulfilled with an account in terms of craftsmanship that chooses its models in light of the Good. But the craftsmanship analogy contains an implicit admission of the limits of rational planning in view of the obduracy of matter. With regard to this point, there are some differences in Plato's treatment of matter in the *Phaedo*, where it is considered a necessitating condition, as compared to the *Timaeus*, where it is treated as an auxiliary cause that combines with the teleological cause to yield the complex things of the sensible world. The Platonic way of formulating the question is to ask about the relationship between Reason and Necessity. If this is the same question which puzzled Socrates in the *Phaedo*, then the *Timaeus* represents an advance in Plato's thinking insofar as Necessity now stands open to rational persuasion. Given the strict limits of my paper, however, I have only outlined some hints about how Plato tries to reconcile rational and mechanical modes of explanation so as to give a likely account that would satisfy the Socratic demand for intelligibility in cosmology. Such a reconciliation involves giving priority to spiritual over material types of explanation, and this ordering of things had a profound influence on subsequent thinkers, including Aristotle and the Neoplatonists.

In the history of science perhaps the most influential Aristotelian division was that between mathematics and physics. From our modern perspective this seems like an unfortunate deviation from the Platonic unification of the two disciplines, which guided Kepler and Galileo towards the modern scientific revolution. By contrast, Aristotle's sharp distinction between the disciplines seems to have led to a barren scholasticism in physics, together with an arid instrumentalism in Ptolemaic astronomy. On the positive side, however, astronomy was liberated from commonsense realism for the conceptual experiments of Aristarchus of Samos, whose heliocentric hypothesis was not adopted by later astronomers because it departed so much from the ancient cosmological consensus. It was only in the time of Newton that convincing physical arguments were able to overcome the legitimate objections against heliocentrism, which had looked like a mathematical hypothesis with no physical meaning.

Thus from the perspective of the history of science, as well as from that of Aristotelian scholarship, it is important to examine the details of Aristotle's philosophy of mathematics with particular attention to its relationship with the physical world, as reflected in the so-called 'mixed' sciences of astronomy, optics and mechanics. Furthermore, we face a deep hermeneutical problem in trying to understand Aristotle's philosophy of mathematics without drawing false parallels with modern views that were developed in response to the foundational crisis at the end of the nineteenth century. On the one hand, it is an inescapable fact about our mode of understanding that we cannot jump over our own shadow, as it were; so that we cannot avoid asking whether Aristotle was a Platonist, intuitionist, logicist, formalist, or some kind of quasi-empiricist. When pursued in this way, the attempt to grapple with Aristotle's philosophy of mathematics is reduced to asking how well his view matches one of the standard modern views that were developed within an entirely different problem-situation in the history of philosophy. But, on the other hand, one wonders whether it is even possible to recover the original problem-situation in which Aristotle's views about mathematics were developed.

[164] *The Role of Mathematics in Aristotle's Philosophy of Science*

William Wians (1996: 131–150) rightly attaches great significance to the large number of mathematical examples used by Aristotle in the *Posterior Analytics*, by contrast with the *Prior Analytics* where they are quite rare. This leads one to wonder whether there are exact parallels between Aristotelian demonstration and Euclidean proof. Aristotle himself seems to assume that mathematical proofs can be given in syllogistic form, but he provides no good examples that might satisfy modern scholars like Mueller and Barnes, who find little or no fit between them. However, I am convinced that Aristotle felt that mathematical proofs could in principle be reformulated in syllogistic format (though he did not carry out this plan)[1] because he used a logical method of subtraction to explain how mathematics is possible as an exact science. For him subtraction is a logical device for identifying the primary subject of any *per se* attributes, which can then be proved to belong to such a subject in a syllogistic way.

It is clear from Aristotle's mathematical examples that he is concerned not so much with analysing the mathematical disciplines themselves as with illustrating his own theory of demonstration. For instance, he names elementary entities like the point, the line, and the unit as objects of study, while identifying number and magnitude as the genera studied by arithmetic and geometry.[2] To avoid modern misunderstandings, it is important to notice that for Aristotle the basic elements or principles of mathematics are not propositions but objects that fall naturally into different subject genera. This is the ontological basis for his famous prohibition against 'crossing into another genus', e.g. trying to prove something in geometry by means of arithmetic. Thus, for instance, in *Posterior Analytics* I, 9 Aristotle rejects Bryson's attempt to square the circle on the grounds that it is based on a logical fallacy, due to his failure to limit the premises to the subject genus studied by geometry. Aristotle's criticism takes for granted the discovery of incommensurability, which led to a sharp distinction between arithmetic and geometry. This historical development in Greek mathematics is also relevant in I, 5 where Aristotle refers to Eudoxus' general theory of proportion, remarking that the theorem about alternating proportions was once proved separately for numbers, lengths, times and solids because these

[1] But see *An. Post.* II, 94a28–31, where Aristotle puts a Euclidean proposition (*Elements* III.31) into syllogistic format.

[2] Cf. *An. Post.* 71a15, 72a21, 75b2–5, 84a11–26, 88b26, 90b33, 93b24.

were not named under a single genus. Eudoxus grouped all of these under a single comprehensive term and this somehow made possible a general theory of proportion in which certain properties can be demonstrated to belong to all of them *per se*. I will return to this historical achievement of Eudoxus later because it provides Aristotle with an important illustration for his claim that one can logically separate (by subtraction) a primary subject of *per se* attributes (thereby making demonstration possible) without ontologically separating it, as Plato is reputed to have done.

But a simple rejection of Platonism is not quite so easy for Aristotle, given that he accepts its fundamental epistemological claim that knowledge is universal (I, 4–5), whereas perception is particular (I, 31). Since mathematics is scientific and precise (I, 13), Plato's objectivity argument implies that it must have separate objects about which it is true, given that it is not true of changing and particular sensible things. We see Aristotle squaring up to this epistemological problem at *Posterior Analytics* I, 24 where he admits that if a demonstration is true then it holds true of some thing. But this seems to imply that there must be a universal object corresponding to a universal | demonstration, e.g. a triangle apart from individual trian- [165]
gles, or a number apart from individual numbers. But at *An. Post.* 85b19–23 Aristotle denies the ontological implications which Platonists drew from this epistemological situation. He admits that there must exist some universal account (*logos*), which holds true of several particulars, and that this universal is imperishable. Yet he denies that this is a separately existing thing, i.e. it does not signify some individual substance but rather some quality, quantity or relation. Here Aristotle is appealing to his *Categories* (5, 2a11–b6), according to which individual substances are the basic realities, while quantities and qualities depend on substances for their existence. Thus from *Categories* 6, 4b20–25 it would appear that the objects of mathematics are either discrete or continuous quantities, so that they are attributes of substance rather than being themselves substances. However, the Platonist account cannot be wholly misguided because mathematicians treat their objects of study as if they were completely separated from sensible things.

Going through the Puzzles

If one wants to understand Aristotle's problem-situation within its proper historical context, one must consider how he understood his own philosophical enterprise with respect to previous thinkers by paying particular

attention to Aristotle's aporetic method, which typically begins with a review of competing opinions. Such a review is carefully constructed so as to produce an impasse which must be broken by any successful solution of the aporia. Usually the solution is already being prepared through his review of opinions, which is structured in terms of an exhaustive outline of logical possibilities. If all of the logically possible views, except one, have been surveyed and refuted, then the remaining logical option must be considered a likely solution. The final dialectical test which Aristotle uses for such a solution is to examine whether it 'saves the phenomena' or captures the grain of truth which he finds to be present in all the reputable opinions (*endoxa*) of his predecessors.

Here I can only sketch how this aporetic method of inquiry operates with respect to some central questions about mathematics which one finds in *Metaphysics* III and XI. The first aporia in Beta which deserves scrutiny goes as follows:

> And we must also inquire into this, (4) whether sensible substances alone should be said to exist or besides these also others, and if others also, whether such substances are of one genus or of more than one; for example some thinkers posit the Forms and also the Mathematical Objects between the Forms and the sensible things.[3] (*Met*. 995b13–18, trans. Apostle)

One can see immediately from this aporia that it is implicitly connected with the previous problem (995b10–13) about whether there is a single science dealing with all substances.[4] These questions arise as part of an extended discussion about the subject matter of his so-called science of first philosophy (or metaphysics) which Aristotle treats as if it were a science in the making. For instance, at *Metaphysics* XI 1059a38, he says that it is difficult to decide whether this science deals only with perceptible substances or with some other separate substances. If the latter is the case then it must deal either with the Forms or with the Mathematicals. Although Aristotle takes it to be evident that the Forms do not exist, he argues that even if one supposes them to exist, there will be a puzzle as to why there are not Forms for other things besides the objects of mathematics.

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[3] The parallel aporia in *Met*. XI, 1, 1059a37 ff. reads as follows: 'In general, there is this problem, whether the science we now seek is concerned at all with sensible substances or not, but rather with some other substances. If with others, it would be either with the Forms or with Mathematical Objects'.

[4] Cf. Alexander, *In Met*. 175.14–176.16. Syrianus *In Met*. 2.15 ff. goes one better by combining three aporias together, though he quotes and discusses each one separately.

What he is raising difficulties about in *Metaphysics* XI is the reputedly Platonic view that the objects of mathematics constitute an intermediate class of substances | between Forms and sensible things, even though no such [166] intermediates are posited between perceptible men and the Form of Man. On the other hand, if such mathematical intermediates are not posited, then it is difficult to see what the mathematical sciences will have as objects of inquiry, since it appears that mathematics cannot be about perceptible things. This is a neat summary of the problem about the ontological status of mathematical objects, as we find it outlined both in *Metaphysics* III and XI. On the one hand, mathematics cannot be about such a class of independent substances because they do not exist, just as Platonic Forms do not exist; but, on the other hand, the mathematical sciences cannot be about sensible things which are subject to change and are perishable. So in his search for a solution to the problem Aristotle must find a middle way by discovering another mode of being for mathematical objects. For him it would be unthinkable that mathematics should not have its own proper subject matter, since this would undermine its status as a paradigmatic science of 'things that can be learned' (μαθήματα).

The second aporia I want to consider is listed last in *Metaphysics* III, 1, though it is closely connected with the aporia already outlined. That aporia covered mathematical objects in a general way under the question about different kinds of substance, whereas this deals more specifically with the ontological status of mathematical objects:

> Moreover, are numbers and lines and figures and points substances in any sense or not, and if substances, are they separate from sensible things or are they constituents of them? (*Met.* 996a12–15, trans. Apostle)

When Aristotle tries to resolve this aporia in *Metaphysics* XIII, he considers precisely the same two options for mathematical objects as substances, namely as separate from sensible substances or in them. There he also attributes each option to some contemporary thinkers, including the Platonists, though Aristotle has changed the framework with his assumption about the primacy of sensible substances.[5]

[5] Perhaps it is by way of reaction against this assumption that the Neoplatonic commentator Syrianus (*In Met.* 12.25 ff.) adopts the strategy of simply asserting the Platonic order of priorities, beginning with the Forms of mathematical objects and concluding with their appearance in sensible things.

Breaking the Impasse

Any adequate account of Aristotle's views on the ontological status of mathematical objects must take its bearings from *Metaphysics* XIII, 1–3. Yet here his search for a solution to this problem takes a step beyond the aporetic strategy in *Met*. III, where he merely reviewed the difficulties on both sides of the question. In XII, 2 he engages in elenctic argumentation by using many of the same difficulties to refute his opponents, so that in forensic terms one can say that he ceases to be an impartial judge and becomes a plaintiff in the case. This seems to be a further step in the dialectical search for truth, because one should not remain bound in puzzlement forever, even though being so bound may be an essential first step towards philosophy.[6] But to break the bonds of *doxa* (typified in the review of difficulties) one needs a 'hard-hitting elenchus' to clear the road into the realm of truth.[7]

Thus it is clear from Aristotle's concluding methodological remarks in XIII, 1 that he regards philosophy as a shared enterprise whose ultimate goal is the extraction of truth from common opinions. As to the rationale for considering the opinions of others, he explains (1076a15–16) that one should be content if one states some things better and other things no worse. This involves some sort of elenctic test for deciding whether things are said well or badly. Indeed Aristotle espouses a rather modest ideal for philosophical inquiry, when he claims that one has done an adequate job if one formulates some
[167] theories that avoid the mistakes of previous thinkers (as exposed through a | successful elenchus), while accepting those views which have survived the critical scrutiny involved in a failed elenchus. That is why one must begin every inquiry with the opinions of predecessors and pursue the truth by attempting to refute them.

For purposes of completeness, Aristotle usually classifies the opinions of predecessors in terms of the logically possible answers to a given question, and so at *Met*. 1076a32–37 he outlines the possible modes of being of mathematical objects, some of which correspond to the opinions of previous

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[6] Thus Aristotle's methodological attitude differs fundamentally from that of the ancient Sceptics who used the aporetic method as an end in itself within their philosophical inquiries.

[7] In terms of his method, therefore, Aristotle owes something to 'father Parmenides', but his greatest methodological debt is to Plato's *Parmenides* and its deliberately constructed antinomies. At *Parm*. 136c5 Parmenides recommends the gymnastic exercise of constructing antinomies as a way of seeing the truth more completely (τελέως) and better (κυρίως). See M. Schofield 1977: 140–158.

thinkers. For instance, the first logical possibility, i.e. that mathematical objects are *in* sensible things (ἐν τοῖς αἰσθητοῖς), corresponds to the opinion reported in *Metaphysics* III, 2, 998a7–19.[8] By contrast, the position represented in the second logical possibility is that mathematical objects are separated from sensibles (κεχωρισμένα τῶν αἰσθητῶν). Although Aristotle does not identify its proponents, I think they must be 'strict' Platonists who all share the view that mathematical objects are separated from sensible things as independent substances, whether these are called Ideas or Intermediates or both. Furthermore, it corresponds exactly with one of the possibilities listed in *Metaphysics* III (996a12–15 & 1001b26–28) under the aporia about whether or not mathematical objects are some (kinds of) substances or not. Assuming a positive answer, the aporia lays out two possibilities for mathematical objects as substances, i.e. either separated from sensibles or belonging to them.

Since the first two possibilities cover the ways in which mathematical objects can exist as substances, the last two possibilities must be about alternative modes of being: (iii) either mathematical objects do not exist (ἢ οὐκ εἰσὶν) or (iv) they exist in some other way (ἢ ἄλλον τρόπον εἰσὶν). The third possibility is included only for the sake of logical completeness, as Aristotle does not consider it further. This apparent oversight can be explained away by reference to the Platonic argument 'from the sciences', whose fundamental assumption is that any genuine science must have a real or existent object.[9] Since Aristotle shares that assumption, he would probably find it unthinkable that the objects of mathematics should not exist at all, because that would leave these paradigmatic sciences without foundations.

So, if the first two possibilities are to be denied and the third ruled out, the remaining option takes on a new importance. As stated, this is the possibility that mathematical objects exist in some other manner. Obviously, it must be some mode of being which lies between complete non-being and being in the primary sense as substance. However, Pseudo-Alexander[10] is premature in describing this mode of being as 'abstract' (ἐξ ἀφαιρέσεως), since Aristotle's own account emerges from the dialectical inquiry rather than being a presupposition for it.

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[8] In order to signpost this view as it is represented by Aristotle, I adopt the convention of italicising the 'in' as follows: '… mathematical objects *in* sensible things'.

[9] In addition, Aristotle connects the argument 'from the sciences' with the Parmenidean dictum that it is impossible to think or inquire about not-being; cf. *De Caelo* III, 1, 298b17–25.

[10] Cf. *In Met.* 725.4.

It is from this dialectical perspective that we should view any argument which serves as a refutation in *Metaphysics* XIII, 2 and which is used again in XIII, 3 to support Aristotle's own positive solution, since it illustrates perfectly the complex role which difficulties play in his procedure. On the one hand, they provide the material for refuting an opponent's view while, on the other hand, they also belong among the phenomena to be 'saved' by any solution that emerges from the process of refutation. In this case, Aristotle bases his objection against the Platonists on the development of a general theory of proportion by mathematicians within the Academy:

> Again, some mathematical propositions are universally expressed by mathematicians in such a way that the objects signified are distinct from these mathematical substances. Accordingly, there will be other substances which
> [168] are separate, which lie between the Ideas and the Intermediates, and | which are neither specific numbers nor points nor specific magnitudes nor time. If this is impossible, it is clear that the others, too, cannot exist separate from the sensible substances. (*Met.* 1077a9–14, trans. Apostle)

Although Aristotle does not specify the referent, the passage indicates it is some kind of universal (καθόλου) theory in mathematics whose range is not limited to any particular quantity, such as the general theory of proportion in Book V of Euclid's *Elements*.[11]

In order to illustrate Aristotle's point here, Ps.-Alexander (729.21 ff.) supplies an example from this theory and another from the general axioms of equality, while Syrianus (89.30 ff.) also cites the same two examples. Similarly, modern commentators treat Eudoxus' theory of proportion as the best example of such a universal mathematics.[12] From this historical perspective, one can now see the power of Aristotle's objection when it is directed against the Platonists, especially those who accepted the general theory of proportion. Given that this theory is not specifically about numbers or points or lines or any of the other kinds of continuous magnitude, which the Platonists considered to be separate substances, they are faced with the following difficulty. One implication (1077a10–11) of their position, when applied to the general theory of proportion, is that there must be some other substance which is separated from and between (μεταξὺ) Ideas and Intermediates. Furthermore, (to compound the difficulty) such a substance cannot be either a number or a point or a magnitude or time. If this result is impossible, as appears to be the case, then it is also impossible for these other mathematical objects

[11] Cf. T.L. Heath 1925, II: 112 ff.
[12] Cf. T.L. Heath, 1925: 138; W.R. Knorr 1975; D.R. Lachterman 1989, ch. 2.

to exist apart from sensible things. The whole objection depends on the assumption that the separation of mathematical objects involves treating them as independent substances.

In the final argument of XIII, 2 Aristotle identifies the nub of his dispute with the Platonists about mathematical objects:

> Let it be granted that they are prior in formula to the body. But it is not always the case that what is prior in formula is also prior in substance. For A is prior in substance to B if A surpasses B as existing separately, but A is prior in formula to B if the formula of A is a part of the formula of B; and the two priorities do not belong to the same thing together. For if attributes, as for example a motion of some kind or whiteness, do not exist apart from substances, whiteness is prior in formula to the white man but not prior in substance; for whiteness cannot exist separately but exists always in the composite. By 'the composite', here, I mean the white man. So, it is evident that neither is the thing abstracted prior, nor is what results by addition posterior; for it is by addition of whiteness that we speak of a white man. (*Met*. 1077a36–b11, trans. Apostle)

The initial concessive μὲν here shows that Aristotle is prepared to accept that mathematical objects are prior in definition (τῷ λόγῳ πρότερα) to sensible bodies, but he minimises the concession by saying that not all things which are prior in definition are also prior in substance (τῇ οὐσίᾳ πρότερα). He supports this distinction by citing different criteria for the two types of priority. Some thing A is prior in substance to something else B if A surpasses B in existing separately, whereas A is prior in definition to B if the definition of A is part of the definition of B. Aristotle warns that the two types of priority do not always belong to the same thing.[13]

Despite the clear logical basis for Aristotle's argument, one might still ask how it is an objection to the Platonist claims about the ontological status of mathematical objects. Given the whole topic of the treatise, it is rather curious that he chooses a quality like whiteness rather than some quantity, in order to make his point about the non-coincidence of two kinds of priority. According to his own categorial framework, however, both quantities and qualities are accidents of primary substance and so can be defined separately from it. Thus the point of Aristotle's example is to suggest that | the Platonists [169] have been misled by this logical possibility. The fact that whiteness can be defined independently of sensible substances does not mean that there is some Whiteness Itself apart from sensible things, as the Platonists thought (*Phys*. 193b35 ff.). Although mathematical quantities are more separable from

[13] See Cleary 1988 for discussion of the different senses of priority in Aristotle.

sensible things than qualities, one cannot infer that they are independent substances from the fact that their definitions do not presuppose any sensible subjects to which they belong *per se*.

This is the general thrust of Aristotle's rather strange conclusion (1077b9–11) in the present passage to the effect that 'the result of subtraction' (τὸ ἐξ ἀφαιρέσεως), is not prior nor is 'the result of addition' (τὸ ἐκ προθέσεως) posterior. The terminology of 'abstraction' is introduced quite suddenly, and the context provides little guidance as to how it should be interpreted, except for an explicit contrast with some process called 'addition'. Fortunately, Aristotle does give us a clue as to what he means by 'addition' when he says that it is as a result of adding to whiteness that the white man is spoken of.[14] From the previous passage we may assume that he is here referring to the addition of a subject (i.e. 'man') that is not the primary subject to which the quality of whiteness belongs *per se*. Conversely, 'abstraction' would be the process of taking away that subject and defining white separately. This is consistent with Aristotle's denial of priority to 'the result of subtraction', since he had previously argued that 'the white' is not prior in substance to 'the white man' even though it may be prior in formula.

In fact, it is quite clear that priority in substance is being denied to the so-called 'results of subtraction'. This may have led some ancient Greek commentators to the conclusion that Aristotle is here referring specifically to mathematical objects.[15] Yet they give no adequate explanation of how mathematical objects could be intelligibly referred to as 'the results of abstraction' or of what implications this terminology has for their ontological status. This is a lacuna even in modern Aristotelian scholarship, which needs to be filled by explaining such terminology and by showing how it describes the logical situation of mathematical objects. Such an analysis must also explain the peculiar fact that the terminology of 'abstraction' is not used by Aristotle in XIII, 3 for his positive account of the mode of being of mathematical objects.[16]

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[14] *Met*. 1077b11: ἐκ προθέσεως γὰρ τῷ λευκῷ ὁ λευκὸς ἄνθρωπος λέγεται.

[15] Cf. Ps.-Alexander, *In Met*. 733.23–24 & Syrianus, *In Met*. 93.22 ff.

[16] D.D. Moukanos (1981: 24 ff.) claims that the conclusion of *Met*. XIII, 2–3 is that mathematics is about abstract objects, which exist through the separating reflection of mathematicians, but he fails to explain why the terminology of abstraction is conspicuously absent from XIII, 3. For my explanation, see "On the Terminology of Abstraction in Aristotle" in this volume.

Providing Solutions to the Aporia

Having refuted the views of others, Aristotle's next task is to provide an alternative account of mathematical objects which will escape the difficulties raised. If his solution manages to do this, while also saving the most authoritative phenomena, then it will be a successful resolution of the problem, according to his methodological criteria. Among these phenomena we expect to find the reputable opinions (*endoxa*) of mathematicians, who are the 'wise' in this case. Thus it is not surprising that Eudoxus' general theory of proportion is made the starting-point for Aristotle's own proposed solution:

> Now, just as certain universal propositions in mathematics, which are about things not existing apart from magnitudes and numbers, are indeed about numbers and magnitudes but not *qua* such as having a magnitude or being divisible, clearly, so there may be propositions and demonstrations about sensible magnitudes, not *qua* sensible but *qua* being of such-and-such a kind. (*Met.* 1077b17–22, trans. Apostle)

Here Aristotle appeals to the fact that mathematicians use general axioms and propositions about quantity as such without positing other objects besides magnitudes and numbers. Structurally, the argument draws a parallel between the fact that there are such general propositions and the possibility that other statements and proofs can be | made about sensible magnitudes. [170]
The first part of the parallel assumes as established that the propositions of general mathematics are not about separated things apart from magnitudes and numbers. Yet, while a proposition from the general theory of proportion is about magnitudes and numbers, it is not about them insofar as (ᾗ) these things have continuity or are discrete.

Therefore, starting from the general theory of proportion, Aristotle draws a parallel which is crucial for his alternative account of all the sciences as being about sensible things. He claims (*Met.* 1077b20–22) that, in a similar way, there can be propositions and proofs about sensible magnitudes, not insofar as they are sensible but insofar as they are such-and-such (ἀλλ' ᾗ τοιαδί). What he appears to mean by this claim is that one can select some definite quality (τοιαδί) of sensible magnitudes and construct demonstrations with respect to it as subject, while excluding the sensible aspects from consideration. Thus he makes the following loose analogy: just as there are propositions about quantity as such, which leave out of account whether the quantity is continuous or discrete, so also there are propositions about sensible magnitudes which do not consider them as sensible but only as magnitudes.[17]

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[17] Syrianus, *In Met.* 95.13–17, expresses some surprise at what he sees as Aristotle's attempt

Let us now consider how Aristotle's use of Eudoxus' theory has advanced his alternative account of mathematical objects. The argument based on the theory of proportion draws the following logical parallel: just as it is possible to have a science about numbers and magnitudes in so far as they are quantities, without the ontological separation of some entity called 'quantity'; so also one can have a science of sensible magnitudes in so far as they are such and such (ᾗ τοιαδί). Perhaps Aristotle is being deliberately vague here so as to make the point that the '*qua*' locution can pick out any aspect of sensible magnitudes and bring it under the subject matter of a particular science. It also establishes the possibility of demonstrative knowledge of that unseparated aspect because the '*qua*' locution indexes the primary subject of whatever attributes are proved to belong to something qua such-and-such.[18]

Now it is upon this logical basis that Aristotle continues to build his argument as follows:

> For just as there are many propositions concerning sensible things but only *qua* moving, without reference to the whatness of each of these and the attributes that follow from it—and it is not necessary because of this that there should exist either a moving of a sort which is separate from the sensible thing or is some definite nature in the sensible thing—so also there will be propositions and sciences about things in motion, not *qua* in motion but only *qua* bodies, or only *qua* planes, or *qua* lengths, or *qua* divisible, or *qua* indivisible with position, or just *qua* indivisible. (*Met*. 1077b22–30, trans. Apostle)

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to find a parallel in ontological status between universals and mathematical objects, since the former are logical entities belonging in the soul, whereas the latter are in sensibles and are also mental abstractions (ἐπινοίαις ἀφαιρούσαις) from sensibles. But such remarks cannot be taken to represent Aristotle's views accurately, and they may even suggest that abstractionism was a product of commentators like Alexander, who proposed it as the official Aristotelian doctrine that was later opposed by Syrianus.

[18] In his logical analysis of what he calls Aristotle's theory of reduplication, Allan Bäck (1996) points out that a *qua* proposition is actually a condensed demonstrative syllogism in which the *qua* term functions as a middle term and as a cause, e.g. an isosceles triangle has this property because it is a triangle. He also argues that the *qua* phrase is attached to the predicate and does not change the reference of the subject term, which he takes to be a particular existent like this bronze triangle. He has objected (in personal communication) that my approach of making *qua* propositions fix our attention on the primary subject has the consequence of changing the reference of the subject term to some kind of Platonic entities about which it would be difficult to verify any knowledge claims. But I respond that the distinction between natural and logical priority in Aristotle separates the *de dicto* question of the primary logical subject from the *de re* question about the basic subject as substance.

As in the previous argument, the general structure of this argument is that of an explicit parallel which is drawn between an actual and a possible situation. Here Aristotle starts from the existence of many statements about things only in so far as they are changing (ᾗ κινούμενα μόνον), quite apart from the particular essence of such things or their accidents.

It is clear that what he is proposing as a basis for the truth and objectivity of any science is the possibility of logically separating its subject-matter from the complex appearances of sensible things. For instance, he emphasises that we are able to make true statements about sensible things qua moving, while leaving out of account the essence of these things along with all other accidental attributes. Obviously, such a leaving out is logical because the essence of anything is ontologically inseparable from it and could not be ignored, for instance, if we were considering something under its species description. It is important to notice, however, that Aristotle mentions the | possibility of leaving the essence out of account through this logical [171] technique of subtraction. If this were not possible then there would be only one science of sensible things, e.g. a science of natural kinds. But he clearly rules out this possibility at the end of the above passage when he draws the second part of his parallel: just as there are propositions about sensible things qua moving, so also there can be propositions and sciences about moving things, not qua moving but qua bodies only (ᾗ σώματα μόνον). In other words, just as one can select some aspect of sensible things as a primary subject for attributes related to motion, so also one can select the bodily aspect of moving things as a subject to which some attributes belong primarily and universally.

Despite the ambiguity of the word σώματα, it seems very likely that Aristotle has in mind the solids (στερεά) whose *per se* attributes are studied by the science of stereometry. The selection of solids as the primary subject of such attributes is indicated by the '*qua*' locution and is achieved through subtraction. Indeed, the passage goes on to list a series of such subtractions which itself seems to have an inherent order. First, one considers moving or changing things, not qua moving but only qua solids. This step involves the logical subtraction of the sensible and changing aspects of things, together with the *per se* attributes that belong primarily to this aspect, e.g. sensible contraries like hot/cold, light/heavy, wet/dry. The analogous step in *Posterior Analytics* I, 4, 74a33–b4, is the subtraction of 'bronze' from the complex subject 'bronze isosceles triangle', thereby eliminating certain sensible attributes. Such a logical step makes possible the isolation of the solid as a primary subject for the attributes which stereometry will demonstrate as belonging to it *per se*.

The method of subtraction can be used again in a logical way to 'strip off' (ἀφαιρεῖν) the third dimension and thereby eliminate its *per se* attributes.[19] This is presumably what Aristotle has in mind at XIII, 3 when he says that there can be a science of sensible things qua planes (ᾗ ἐπίπεδα), i.e. plane geometry. Similarly, the second dimension can be logically removed so as to make possible the study of sensible things qua lengths (ᾗ μήκη). The method of subtraction allows one to identify certain attributes as belonging universally to the line as a primary subject, e.g. straight and curved belong to bodies insofar as they contain lines. Therefore, strictly speaking, it is only qua line that a sensible thing can be said to be either straight or curved. Although Aristotle does not mention Protagoras within this context, one can now see how one might defuse his well-known objection that mathematical definitions (e.g. for the tangent of a circle and a line) are not true of sensible things. When Protagoras objects that a sensible circle and ruler do not meet at a point, he is wrongly assuming that this property belongs to the contact of the circle and the line insofar as they are sensible. In general, this mistake is being made by anyone who appeals to some empirical fact about a sensible diagram in order to refute a geometrical claim.

In terms of his whole project in *Metaphysics* XIII, 1–3, however, we would expect Aristotle to specify an alternative mode of being for mathematical entities which conforms with the actual practice of mathematicians, as he does in the following passage:

> A thing can best be investigated if each attribute which is not separate from the thing is laid down as separate, and this is what the arithmetician and the geometrician do. Thus, a man qua a man is one and indivisible. The arithmetician lays down this: to be one is to be indivisible, and then he investigates the attributes which belong to a man qua indivisible. On the
> [172] other hand, | the geometrician investigates a man neither qua a man nor qua indivisible, but qua a solid. For it is clear that the attributes which would have belonged to him even if somehow he were not indivisible can still belong to him if he is indivisible. Because of this fact, geometers speak rightly, and what they discuss are beings, and these are beings; for 'being' may be used in two senses, as actuality and as matter. (*Met*. 1078a21–31, trans. Apostle)

What Aristotle here proposes as a solution, i.e. that mathematical objects exist 'as matter' (ὑλικῶς), has itself prompted many different interpretations.[20]

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[19] Cf. *Met*. VII, 3, 1029a10 ff. & XI, 3, 1061a28 ff.

[20] F.A. de Haas, 'Geometrical Objects in Aristotle' (unpublished mss) finds two major types of interpretations within the range given by scholars such as I. Mueller 1982: 146–164, J. Lear 1979–1980: 188–210, J. Barnes 1985: 97–133, M. Mignucci 1987: 175–211, J. Annas 1987: 131–147, D.K.W. Modrak 1989: 121–139, E. Hussey 1991: 105–133.

Instead of rehearsing these views, I will follow the hermeneutical maxim that Aristotle's brief and ambiguous solution must be interpreted in terms of the whole aporetic inquiry.[21]

The above passage begins with a methodological recommendation for the other sciences based on the procedure of mathematicians. I take the word οὕτω to refer back to that procedure, which is then redescribed in a conditional clause as follows: 'if one posits as separate what (in reality) is not separated …'.[22] This clause contains a clear contrast between the logical and ontological implications of the positing activity of the arithmetician and the geometer. While their subject-matter may be treated as logically separate, Aristotle insists that it is not separated in reality. Therefore he recommends this procedure for each of the other sciences because it promotes greater accuracy without leading to error.

The most obscure part of this passage is the description of how the arithmetician considers a man as one indivisible thing, while the geometer treats him as a solid. One may be tempted to object that the mathematician does not deal with man at all, whether as unit or as solid, but that would be to miss the whole point of his argument.[23] For Aristotle does not want to claim that mathematics is about mankind, though he does wish to establish that these sciences can be viewed as dealing with sensible things under highly specific aspects. Obviously, he is concerned with the truth of mathematics which, according to his correspondence theory, depends on the existence of real entities. For instance, the statement about the arithmetician begins with an explicit comparison between what is posited by him and what is actually the case. On the one hand, Aristotle says, a man qua man is one and indivisible (ἓν μὲν … καὶ ἀδιαίρετον) while, on the other hand, the arithmetician posits the unit as indivisible (ὁ δ' ἔθετο ἓν ἀδιαίρετον) and then considers whether any attributes belong to the man qua indivisible. The point implicit in the Greek construction seems to be that the arithmetician has not assumed any falsehood, despite the fact that he posits the unit as if it were independent of the sensible world. Aristotle's use

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[21] Hussey (cited above) recognises that Aristotle's discussion in *Met.* XIII, 3 is incomplete on its own, but he fails to see the broader aporetic context within which one should understand the solutions given there. Although Barnes and Annas (both cited above) insist that the solution must be seen exclusively in terms of the inquiry at XIII, 1–3, yet that context is surely too narrow.

[22] *Met.* 1078a21–22: εἴ τις τὸ μὴ κεχωρισμένον θείη χωρίσας.

[23] If one accepts Frege's analysis of number as a second-order property, one might still object that Aristotle is simply wrong to think of it as a first-order property of sensible things. But that would be a different objection from the one that I describe as missing the point.

of the aorist here, combined with a temporal index word (εἶτ'), suggests that the arithmetician simply goes ahead and posits an indivisible unit without reflecting on his ontological assumptions, and this conforms quite well with what Aristotle says elsewhere[24] about the practice of mathematicians. In fact, he does not think it is any part of their business to investigate foundational questions.[25] As a philosopher, however, Aristotle must ground the mathematical sciences in the reality of the sensible world, especially since he has undermined the foundations which the Platonists gave them in the supersensible realm.

In the present passage, therefore, he tries to establish that these sciences are true of sensible things under a certain description. For instance, one can count men without falling into error because a man qua man conforms to the definition of a unit which is posited by the arithmetician. By contrast, if one tried to count the same things qua coloured, the possibility of error and confusion is greater. In modern jargon, one might formulate the difference between 'man' and 'colour' as follows: whereas the former is a sortal term that
[173] divides its reference cleanly, the latter is a mass term that does not.[26] | There is also some basis for a corresponding distinction in Aristotle's work where he recognises that only certain concepts provide us with a measure for counting a collection of things (*Met*. 1014a26–31, 1088a4–11). Here he specifies very carefully the aspect under which an arithmetician might consider a sensible thing such as a man. Even though a man is one and indivisible insofar as he is a man (i.e. under the species description), the arithmetician is not interested in him as such; otherwise he would be engaged in some kind of biology. Indeed, the mathematician only deals with a man insofar as he is an indivisible unit and so far as some numerical attributes belong to him under that description.

All ancient varieties of Platonism are being resisted by Aristotle as he struggles to find a plausible way of connecting the science of geometry with sensible things. This is why he uses a counter-factual conditional to talk about what could belong to a man if he were not indivisible, and so it is only through the '*qua*' locution that he can establish the logical possibility of talking about a man insofar as he is a solid (ᾗ στερεόν). When this aspect has been isolated as a primary subject, it is possible to claim without contradiction that a man has certain *per se* attributes which are directly opposed to those which belong

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[24] Cf. *An. Post*. 76a31–36, 76b3–11, 92b15–16, 93b21–28.
[25] See *Met*. 1025b3–18, 1059b14–21, *Phys*. 184b25–185a5.
[26] See P.F. Strawson 1959: 167 ff.

to a man qua unit. In addition to the logical situation, however, the mode of being of this aspect must be clarified before one can be assured of the truth of geometry as a science concerned with sensible things. This appears to be what Aristotle has in mind when he insists that geometers speak correctly (ὀρθῶς) and that they are speaking about 'beings' (ὄντα) which really do exist. In support of this claim, he appeals to two general senses in which 'being' is used, namely, being in the sense of actuality (ἐντελεχείᾳ) and being in a material sense (ὑλικῶς). Given the familiar look of this distinction, it is natural to think that ὑλικῶς must stand for potential being, but yet we must wonder about Aristotle's reasons for choosing this word rather than δύναμις. To grasp his meaning, however, we should confine ourselves to asking how the conclusion should be understood within the context of the whole argument in XIII, 1–3, especially in view of the linguistic hint that mathematical objects may have a mode of being analogous to that of matter rather than to that of substantial form. The simplest way to interpret this hint is that mathematical objects have a dependent mode of being by contrast with the independence that is characteristic of substances. But, in order to save the phenomena, this must also provide a solution that satisfactorily resolves the difficulties raised in *Metaphysics* III.

Firstly, it clearly avoids all the difficulties arising from treating mathematical objects as independent substances either *in* sensible things or separate from them, since Aristotle denies them the mode of being of substantial forms. Furthermore, given that mathematical bodies are not substantial, they will not be competing for the same place with physical bodies, since they are potentially but not actually in sensible things. Just as the statue of Hermes is potentially in the marble block before it has been sculpted, so the geometrical lines, planes and solids are potentially in sensible objects before they have been separated out by the method of subtraction. But this parallel also tends to suggest that the mathematician is like a craftsman who actively shapes the matter which would remain merely potential without his agency, and it is unclear whether Aristotle is committed to such an implication. In *Metaphysics* III he does talk about the 'generation' of geometrical divisions but that is an instantaneous rather than temporal process, so that it is quite different from any kind of physical or artistic generation. | However, [174]
there may be some parallels with the activity of the intellect in grasping mathematical objects which are paradigmatic 'things to be learned'.

Conclusion

Returning to my hermeneutical point of departure, I want to reconsider whether Aristotle's philosophy of mathematics can be expressed in any of the standard modern views such as Platonism, logicism, formalism, intuitionism, or quasi-empiricism. Given his rejection of ancient Platonism in mathematics, it would seem difficult to treat him as a Platonist even though he does accept that mathematical objects are real entities independent of the human mind. Yet this would make him a realist at least, and perhaps even a Platonist like Frege. But a better case might be made for treating him as a logicist, given the logical basis for his theory of subtraction that grounds his account of the mathematical sciences.[27] However, this does not seem to fit either, because Aristotle regards logic as preparatory for the sciences, whereas mathematics is one of the theoretical sciences. Unlike Frege and Russell, he makes no attempt to reduce mathematics to logic and his defence of the principle of contradiction in *Metaphysics* IV relies more on ontology than on logic. In fact, given the explicit parallels which Aristotle draws between mathematics and physics, one might try to classify him as a quasi-empiricist like Lakatos who insists that mathematics has many experiential and *a posteriori* elements just like physics. But again Aristotle never draws a clear distinction between *a priori* and *a posteriori* propositions, and his model of mathematics as a demonstrative science does not fit very well with the quasi-empiricism of Lakatos and his more radical followers.

On the other hand, given Aristotle's views on the potential infinite, it would appear that he should be classified as an intuitionist like Brouwer and Heyting. Yet, as Lear rightly points out (1988: 68n34), we must be wary of the apparent similarity between these ancient and modern views. While Aristotle makes the potential infinite dependent on the nature of magnitude itself, modern intuitionists make it dependent on the existence of a finite process carried out by the creative mathematician. This difference in emphasis nicely illustrates the post-Cartesian shift in perspective from an object-centred to a subject-centred epistemology. Indeed, from this post-Cartesian perspective, we can better understand the difficulty of classifying Aristotle's philosophy of mathematics in terms of any contemporary view. The sceptical gap that Descartes opened up between knower and object known led modern

[27] In fact, R. Netz (1999: 214) claims that Aristotle should be regarded as a logicist in the modern sense, but I think that Netz fails to take into account the different problem-situations that prevailed in the widely separated historical eras.

philosophers to focus on questions about subjectivity and objectivity in science, rather than on questions about truth as simple correspondence between the object known and the knower. It is precisely because of sceptical doubts about the human mind's access to reality that the distinction between *a priori* and *a posteriori* propositions became relevant. Within this modern problem-situation, British empiricists such as Locke and Hume tried to combat scepticism by appealing to abstraction as an epistemological process by means of which the human mind can begin from sense experience and reach universal knowledge. Such an appeal to a traditional Aristotelian view seemed to be legitimated by ancient and medieval commentators on Aristotle who described his epistemology in terms of abstraction. However, Frege's critique of abstractionism as a psychological theory made it appear unsustainable, so that Aristotle's epistemology lost the legitimacy which it seemed to have for British empiricists. Yet, if I am correct about Aristotle not being an epistemological | abstractionist, one might still treat Aristotle as a [175]
logical realist like Frege himself. In any case, whatever modern parallels one draws with Aristotle's position, it should be clear that all of them will tend to be misleading unless one pays close attention to the different problem-situations involved.

Introduction

In order to give an adequate account of Proclus' philosophy of mathematics, it is necessary to do at least three things: (1) provide an historical account of his inherited problem-situation; (2) give a general analysis of Proclus' views about the ontology, epistemology and methodology of mathematics; and (3) finally, situate his philosophy of mathematics within the broader context of his whole project, especially the systematization of theology. Although I cannot hope to cover all these points adequately in a short paper, still I do want to insist on all three as being necessary, but especially the last point because it is usually ignored in discussions guided by the presuppositions of modern philosophy of mathematics. Since mathematics is an independent and exact science, philosophers tend to assume that one can discuss its foundations and modes of knowing in complete separation from most other disciplines (except perhaps logic) and certainly from metaphysics. To paraphrase Bertrand Russell, mathematics is an exact science in which nobody knows exactly what they are talking about, and it doesn't matter.[1]

By contrast, for ancient philosophers from Plato onwards, it matters a great deal whether the mathematician is dealing with sensible things or with some intelligible entities quite separate from the sensible world. If mathematics deals only with the sensible world, for instance, then it would not serve Plato's purposes in the *Republic* as the propaedeutic science that turns the human soul away from the world of sensible images towards the real world of intelligible Forms. For him mathematics is the pivotal science in the education of the guardians precisely because it is Janus-faced, i.e. it depends on images or diagrams which anchor it in the sensible realm, but its hypotheses can only be adequately grounded in the intelligible world of Forms. It is therefore an intermediate discipline that can be used to mediate between the two worlds, so long as its practitioners have the right orientation, i.e. their goals must be theoretical rather than pragmatic or banausic. This

[1] See Russell (1901: 84): '[M]athematics is the subject in which we never know what we are talking about nor whether what we are saying is true.'

[86] was the vision of mathematics as a discipline for spiritual reorientation | that dominated the subsequent Platonic tradition, even if many people paid only lip-service to that ideal.

So there was much more than an 'academic' debate involved when Aristotle took issue with Plato concerning the ontological status of mathematical objects, by insisting that they are not separate substances any more than are the Forms, but are aspects of the sensible world which are isolated through thinking. I have argued elsewhere[2] that what is at stake here is the whole question of whether mathematics or physics should be the cosmological science that determines our picture of the world. I will not rehearse these arguments here, though it is relevant to note that Proclus conceived of geometry as the cosmological science par excellence. At the moment, what is more to the point is Aristotle's alternative account of the mode of being of mathematical objects and of our epistemological access to them. Although I think the terminology may be misleading,[3] let us assume that he gave the standard Aristotelian account of them as abstract objects which are grasped through sense experience when the numbers and figures of sensible things are separated from their matter by the mind. As a result of this anti-Platonic account, the battle lines were drawn for the whole subsequent tradition of Neoplatonism.

Proclus shared with his teacher Syrianus a firm opposition to the doctrine of abstractionism which had made its way into the Neoplatonic tradition, possibly through the influence of Porphyry. Ian Mueller (1990) has traced this doctrine back to Alexander of Aphrodisias, who made it an authoritative Aristotelian doctrine which was adopted by those Neoplatonists who were anxious to harmonise Plato and Aristotle. But Syrianus rejected abstractionism as an inadequate account of our ascent to the realm of Forms, and proposed an alternative account based on the typical Neoplatonic hierarchy of *Nous*, Soul, and Nature. At the highest noetic level, geometrical Forms are unextended and indivisible, so that only at the level of Soul can they become available for study by the geometer when they are embodied in the intelligible matter associated with the imagination. Syrianus (*In Met.* 95.29 ff.) also accepts that geometrical forms may be embodied in sensible matter but as such they can never have the precision necessary for science, nor could they ever acquire it through abstraction. Thus the diagrams used by the geometer are products of the imagination, which are really

[2] See Cleary 1995, especially chs. 1 & 2.
[3] See pp. 301–332 below.

projections by the higher intellect onto a lower level so as to facilitate the study of geometrical objects. Syrianus seems to accept that human intellect can never attain the Platonic goal of studying geometrical Forms in their pure and unextended form as paradigms. Although such a goal can only be fully achieved by divine *Nous*, yet it subsequently became for Proclus the guiding ideal for his whole system.

Most modern scholars who pay attention to Proclus' commentary on the first book of Euclid's *Elements* study it purely from the point of view of the history or philosophy of mathematics.[4] In this paper I will not take issue with this approach, | though I consider it too narrow, since I want to [87] supplement it with a neglected perspective which corresponds better to Proclus' broader purpose in making such a commentary. Along with being a fervent Neopythagorean, this late Neoplatonist of the Athenian School took very seriously the curriculum for educating the philosopher-ruler in Plato's *Republic*. For Proclus the importance of mathematics in that curriculum could hardly be over-emphasised because it reorients the human soul towards the realm of intelligible being. Ultimately, he thinks that this realm must be studied by theology, which for him involves the reconciliation of Aristotelian metaphysics and Platonic dialectic.[5]

I. *The Intermediate Status of Mathematics*

At the beginning of the first Prologue to his Euclid commentary, significantly enough, Proclus discusses mathematical being (οὐσία) in terms of its intermediate status between partless realities which are the most simple, and divisible physical things which are the least simple of all things. According to him, mathematical objects must be superior (ὑπερανέχουσαν) to the things that move about in matter, since mathematical propositions are unchangeable, stable, and incontrovertible. On the other hand, the discursive (διεξοδικόν) procedure of mathematics, which treats its objects as extended and sets up different principles for different objects, implies

[4] Cf. Hartmann 1909. Although Hartmann's basic focus is on the philosophy of mathematics, his neo-Kantianism leads him to reflect on the metaphysical presuppositions of Proclus' position. In that respect, he is superior to many of the more recent interpreters.

[5] In the light of Proclus' own education under Plutarch and Syrianus, it is not surprising that he should regard Aristotle's metaphysics as the starting-point from which one must ascend to Platonic dialectic or theology. Of course, the 'daimonic' Aristotle was regarded by all Neoplatonists as having merely anticipated the science of theology which they developed, but thinkers like Proclus smuggle a surprising amount of Aristotelian elements into their theology.

for Proclus that such objects are inferior in being to that indivisible being which is completely grounded in itself.

After establishing this ontological division, Proclus attributes it to Plato on the grounds that it corresponds to the latter's distinction between different types of knowing. For instance, intellect (νοῦς) is held to correspond with indivisible realities because of their purity and freedom from matter (ἀΰλία). By contrast, opinion (δόξα) corresponds with divisible things at the lowest level of sensible natural objects; whereas understanding (διάνοια) goes with intermediate things such as the forms (εἴδη) studied by mathematics. While accepting it as inferior to intellect, Proclus argues that understanding is more perfect (τελειοτέρα), more exact (ἀκριβεστέρα), and purer (καθαρωτέρα) than opinion:

> For it traverses and unfolds the measureless content of *Nous* by making articulate its concentrated intellectual insight, and then gathers together again the things it has distinguished and refers them back to *Nous*.[6]

Despite the appeal to Plato's authority and the use of familiar language from the *Philebus* (58–59), I think that what we have here is something unique to Proclus, namely, epistemological and ontological grounds for composing
[88] his *Elements of* | *Theology* after the model of Euclid.[7] The crucial point for this project is that (mathematical) understanding is seen as a means by which the unitary content of intellect is reflected in a multiple form that makes it accessible to our discursive thinking. Even though he insists that mathematical objects are multiform images which only imitate the uniform patterns of being, one suspects that Proclus finds them indispensable for gaining access to the completely unitary objects of intellect. At least, this is one way of interpreting the metaphor about mathematicals standing in the vestibule (ἐν προθύροις) of the primary forms, announcing their unitary and undivided and generative reality (*In Eucl.* 5.2–3).

This interpretation appears to be supported by Proclus' treatment of Limit and Unlimited both as mathematical principles and as principles of being as a whole. According to his ontology (cf. *ET*. Prop. 89), these are the two highest principles after the indescribable (ἀπεριήγητον) and utterly incomprehensible (ἄληπτον) causation of the One. By contrast with the completely unitary One, these transcendent principles *do* give rise to an

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[6] Proclus, *In Eucl.* 4.12–14, trans. Morrow.

[7] Although it seems obvious that Proclus adopted the Euclidean model for composing his own *Elements*, it is not so easy to specify exactly what aspects of his demonstrative method are derived exclusively from Euclid, as distinct from Platonic dialectic and Aristotelian syllogistic.

ordered procession (πρόοδος) of things that appear in their appropriate divisions. The objects of *Nous* (τὰ νοητά), for instance, by virtue of their inherent simplicity, are the primary participants of the Limit and the Unlimited; since their unity, identity, and stable existence are derived from the Limit, while their variety, fecundity, and otherness are drawn from the Unlimited.

Although mathematical objects are also the offspring (ἔκγονα) of the Limit and the Unlimited, Proclus insists (*In Eucl.* 6.7 ff.) that some secondary principles are involved in the generation of this intermediate order of things. While Proclus does not specify what secondary principles he has in mind, his examples suggest that they are principles in arithmetic and geometry which are seen as reflections of the primary principles of Limit and Unlimited. In the mathematical order of being, he says, there are ratios proceeding to infinity (reflecting the Unlimited) but controlled by the principle of the Limit. For instance, number is capable of being increased indefinitely, yet any specific number chosen is finite. Likewise, magnitudes are indefinitely divisible, yet the magnitudes distinguished from one another are all bounded, and the actual parts of the whole are limited. From these examples, I think it is clear that the Unlimited is reflected in the multiplicity of number and in the divisibility of the continuum, both of which are controlled by some principle which reflects the Limit.[8] Since mathematics presents such an accessible model for the characteristic activity of these principles, it is no wonder that Proclus finds it so indispensable for understanding how they function also in the intelligible realm, which is part of the subject-matter of his theology.

But, as well as treading the ontological path towards this goal, Proclus (*In* [89]
Eucl. 10.15 ff.) may be seen as following a parallel epistemological path when he addresses the question of which faculty (κριτήριον) pronounces judgment in mathematics. On this question, once again, he defers to the authority of Plato, whose *Republic* he takes to be making firm connections between forms of knowing and knowable things. I think, however, that Proclus is overinterpreting Plato's simile of the divided line by assigning intellection (νοῦς) exclusively to intelligibles (νοητά), while connecting understanding

[8] Proclus seems to follow the Aristotelian notion that the infinite is present only potentially either in number or in magnitude, since what is actual is always finite. But it would appear that for Proclus this potential infinity, which is associated with intelligible matter, is different from the infinite potency associated with the One. On this point, Proclus seems to follow Plotinus *Enn.* III.8.10,7; IV.8.6.11 rather than Aristotle.

(διάνοια) with 'understandables' (διανοητά) as its exclusive objects.[9] Despite its tautological appearance, this latter connection is not made explicitly in the *Republic*, and I think it has been argued successfully by Myles Burnyeat (1987) that precisely this question is left open by Plato himself. But Proclus is on firmer textual ground when he attributes to Plato the parallel connections between belief (πίστις) and perceptibles (αἰσθητά), and between conjecture (εἰκασία) and images (εἰκαστά). Similarly, he is correct in saying that Plato finds the same relation between conjecture and perception as between understanding and intellection, since the first apprehends images of the second in each case. In the *Republic*, conjecture is illustrated in terms of images of sense objects that are reflected in water or some other shiny surface, which means that such images of images have the lowest place in Plato's ontology.

One might argue that the parallel relation between understanding and intellection implies that 'understandables' are images of intelligibles, but the fact remains that Plato nowhere draws this seemingly obvious conclusion. However, Proclus does draw this conclusion and upon it he builds his own theory about the mode of being of mathematicals and the special cognitive faculty which grasps them. Since mathematical objects have neither the status of partless and indivisible objects, nor of perceptible and changeable objects, he thinks (*In Eucl.* 11.10–16) it is obvious that they are essentially 'understandables' and that understanding is the faculty which judges them. He offers this as a commentary on the *Republic* (533d) where Socrates describes the knowledge of 'understandables' as being more obscure than the highest science, though clearer than the judgment of opinion. By way of interpreting this passage, Proclus explains that mathematical understanding is inferior to intellectual insight because it is more explicative (ἀνειλιγμένον) and discursive (διεξοδικόν), though it is superior to opinion on account of the stability (μόνιμον) and irrefutability (ἀνέλεγκτον) of its ideas. Furthermore, the fact that mathematical sciences begin from hypotheses makes them inferior to the highest knowledge, yet their preoccupation with immaterial forms (ἀΰλοις εἴδεσιν) makes their knowledge more perfect than sense perception. Here we find some useful pointers for Proclus' own views about the differences between mathematics and the highest science of intelligibles, which may be called either dialectic or theology.

[9] See *De Providentia* for a more detailed discussion of Plato's divided line; cf. also *In Alcib.* 240.

II. *The Problem of the Ontological Status of Mathematical Objects* [90]

A careful reading of both Prologues to Proclus' commentary on Euclid reveals that one of the great obstacles to Neoplatonic attempts at reconciling Plato with Aristotle was the old dispute over what mode of being should be assigned to mathematical objects. In dealing with this question, Proclus adopts an aporetic approach which consists in outlining alternative views, presenting objections to them, and then setting out his own position. But it is hardly an open-ended dialectical inquiry because he has already (*In Eucl.* 12.7–9) made up his mind to follow Plato by assigning to mathematical objects an existence (ὑπόστασις) prior to sensible objects, as reflecting the processional order (πρόοδος) of things. Therefore, it is for the purpose of refutation that he sets out the alternative views about mathematicals as being derived from sense objects, either by abstraction (κατὰ ἀφαίρεσιν) or by collection from particulars (κατὰ ἄθροισιν τῶν μερικῶν) to yield one common definition. The second view seems to involve some process of induction whereby mathematical universals are grasped through the experience of particulars, thereby implying that mathematicals are ontologically dependent upon such sensible particulars. But Proclus never clarifies exactly how this view differs from abstractionism.[10]

According to Proclus, however, soul is the only possible source of the certainty and precision that one finds in mathematics. Behind this assumption one can discern the metaphysical principle that the character of the cause is transferred to the effect. Such a principle seems to ground his next objection, which states that one cannot explain the stability of unchangeable ideas if they are held to be derived from things which are continually changing from one condition to another. In this context (*In Eucl.* 12.26–13.6) he takes it as agreed (ὁμολογεῖται) that anything which results from changing things receives from them a changeable character. So how could it be possible for exact and irrefutable ideas to emerge from what is inexact and uncertain?

Once again, the rhetorical question betrays the dogmatism behind the ostensible aporetic inquiry, as Proclus moves quickly to his conclusion (*In Eucl.* 13.6 ff.) that the soul must be posited as the generatrix (γεννητική) of mathematical forms and ideas. While citing Plato as his authority, he asserts that the soul can produce such mathematical objects because their paradigms

[10] It is possible that the second is a Stoic view of how all universals, including mathematical universals, are derived from the experience of particular bodies. But Mueller (1987a: 315) finds no indication in Proclus that he regards the two proposed modes of derivation as significantly different.

already subsist in her, so that she can bring forth these projections (προβολαί) of previously subsisting forms. In support of this rather un-Platonic view about the mode of being of mathematical objects, Proclus argues that the soul must have these standards in herself by which she can judge whether her offspring are fertile or merely 'wind-eggs'. If that were not the case, he asks rhetorically, how could she produce such a variety of ideas? Here a
[91] sceptic might object that this is simply begging the question, | since there is no guarantee that the soul has any internal standard by which to judge the correctness of what is produced by imagination. However, it is obvious that Proclus is not troubled by any sceptical doubts when he concludes that the birth-pangs and subsequent offspring of the soul must yield manifestations (ἐκφανεῖς) of eternal forms abiding in her.[11]

Against the possibility that the soul derives mathematical forms from itself alone, Proclus objects (*In Eucl.* 15.22) that this would prevent them from being images of intelligible forms (τῶν νοερῶν εἰδῶν). But, he asks rhetorically, how can they fail to receive their share of the filling up of being from the 'firsts' (ἀπὸ τῶν πρώτων εἰς τὸ εἶναι συμπλήρωσιν), given their intermediate (μεταξύ) position between indivisible and divisible natures? Again it would appear that Proclus is begging the question by assuming that mathematical objects have such an intermediate status, but if he were merely describing the self-evident character of these objects then perhaps he would not be guilty of *petitio principii*. Yet it does seem that he is assuming too much from his own metaphysics when he objects (again by means of a rhetorical question) that, if mathematical objects come only from the soul, then the forms in *Nous* cannot retain their primacy as the preeminent patterns (πρωτουργὰ παραδείγματα) of all things. Here the quasi-Platonic language, combined with the rhetorical style of argument, indicates that Proclus has already presupposed the metaphysical framework into which mathematical objects must fit.[12]

In relation to the second possibility that these objects come from *Nous* alone, he asks (*In Eucl.* 15.26 ff.) how the self-activating (αὐτενέργητον) and self-moving (αὐτοκίνητον) character of the soul is to be preserved, if one accepts that it receives its ideas from elsewhere, like things that

[11] Proclus' dogmatism is reflected in his impatient dismissal (*In Eucl.* 15.14–15) of those who say that the soul gets its ideas from sensible things, since this would imply that the soul is inferior to and dependent upon enmattered forms.

[12] Mueller (1987b) has shown, by means of a detailed comparison with Iamblichus, that the intermediate status of mathematicals was a common assumption shared by the whole Neopythagorean tradition of late antiquity.

are 'other-moved' (ἑτεροκινήτων). What Proclus finds objectionable here is any conception of the soul as purely passive like matter which, although potentially all things, does not generate any of the forms embodied in it. Without further ado, he takes this to be an insuperable objection to the second possibility, so that only the third option remains, namely, that the soul gets its ideas both from herself and from *Nous*. Proclus describes (*In Eucl.* 16.5–8) the soul in metaphorical terms as having 'the full complement of forms' (πλήρωμα τῶν εἰδῶν), which themselves are constituted from intelligible patterns but which enter spontaneously (αὐτογόνως) upon the 'stage of being' (εἰς πάροδον).

The purpose of this metaphorical language is to replace the traditional Aristotelian conception of soul as a blank tablet (γραμματεῖον κενόν) with the notion of a tablet that has always been inscribed (γεγραμμένον) and is always writing itself (γράφον ἑαυτό), and is also being written on by *Nous* (ὑπὸ νοῦ γραφόμενον, *In Eucl.* 16.8–10). As Proclus explains, the ground for this conception of soul is that it is an unfolding (ἀνελίττων) of the *Nous* which presides over it, so that soul | becomes a likeness (εἰκών) and external replica (τύπος ἔξω) [92] of *Nous*. The explanation involves two different levels of cognition such that, as he says, *Nous* is identical with everything in an intellectual way (νοερῶς), whereas soul is everything in a soul-like manner (ψυχικῶς). Thus, Proclus says, if *Nous* reflects everything paradigmatically (παραδειγματικῶς) then soul does so in an image fashion (εἰκονικῶς), or if *Nous* is everything in a concentrated way (συνῃρημένως) then soul is everything discursively (διῃρημένως).

According to Proclus, therefore, the essence of the soul consists in such forms as self-moving numbers, living figures, and invisible circles. But he explicitly warns (*In Eucl.* 17.5 ff.) against assuming that number here means a plurality of monads (μονάδων πλῆθος)[13] or that the idea of interval involves bodily (σωματικῶς) extension. Instead one must think of all these forms as living and intelligible paradigms of visible numbers, figures, ratios, and motions. By way of vindicating such a conception, Proclus appeals (*In Eucl.* 17.9 ff.) to Plato's *Timaeus*, which seems to construct the soul in terms of mathematical forms that are thereby established as the causes of all things. He refers specifically to those passages (*Tim.* 35b–c, 36a–b) which seem to make

[13] Here Proclus seems to follow the lead of Syrianus (*In Met.* 135.16–32) who insists that the numbers defined by Euclid as multiplicities of monads are not real numbers, since the latter are *logoi* in *dianoia* which are unities without multiplicity. Similarly Proclus (*In Eucl.* 95.23–96.11) differentiates between arithmetic, which is about monadic number that has no position but exists in *doxa*, and geometry which studies figures that are projected through imagination and have a place provided by intelligible matter.

the principles of numbers and of figures fundamental in the composition of the soul, and to posit its primary circular motion as the principle for all other motions.

But I am not going to discuss whether or not his interpretation of Plato holds up, since the important thing is that such 'evidence' enables Proclus to conclude (*In Eucl.* 17.22–24) that the mathematical *logoi* filling up (συμπληροῦντες) souls are both substantial (οὐσιώδεις) and self-moving (αὐτοκίνητοι). According to him, it is by projecting (προβάλλουσα) and unfolding (ἐξελίττουσα) these *logoi* that the understanding (διάνοια) brings into being (ὑφίστησι) all the mathematical sciences. Thus Proclus is clearly committed to saying that these sciences and their objects somehow depend for their existence on the soul, but yet that such objects are themselves independently real and substantial. Although such a view of the relation between mathematicals and the soul places him within the Platonic tradition, his 'projectionism' (as Mueller 1987a and 1987b calls it) seems to be inherited from the Neopythagoreanism of Iamblichus and Syrianus.

III. *The Role of Mathematics in Proclus' Epistemology and Methodology*

We can garner some clues about Proclus' own epistemology from his subsequent discussion (*In Eucl.* 18.5 ff.) of the function, powers, and scope of general mathematics. In line with his previous discussion, he posits dianoetic
[93] thinking (τὸ διανοητικόν) | as the function (ἔργον) of mathematics in general. Such thinking is distinct from noetic thinking (τὸ νοερόν) which is firmly based on itself, i.e. it is complete and self-sufficient, and ever converging on itself. It is also distinct from both opinion (δόξα) and perception (αἴσθησις), which fix their attention on external things and concern themselves with objects whose causes they do not possess. By contradistinction to all these modes of psychic activity, mathematical thinking begins with 'reminders' from the external world and ends with internal ideas. Although it is awakened to activity by lower realities, its ultimate destination is the higher being of the Forms. Unlike the intellect, its activity is not motionless but neither does it have the motion of the senses, because that would involve change of place or of quality. Instead, according to Proclus, it has a life-giving (ζωτική) motion which unfolds (ἀνελίσσεται) and traverses (διέξεισι) the immaterial cosmos of ideas in two opposite directions.[14] At one time it moves from principles to

[14] See Gersh 1973.

conclusions but, at another time, it moves from conclusions back to principles. In other words, sometimes it moves from what it already knows (ἀπὸ τῶν προγιγνωσκομένων) to what it seeks to know (ἐπὶ τὰ ζητούμενα), whereas at other times it refers the things sought back to principles that are prior in knowledge (ἐπὶ τὰ προηγούμενα κατὰ τὴν γνῶσιν). The traces of Aristotelian terminology here suggest that Proclus has in mind the reciprocal directions in inquiry that are usually called synthesis and analysis.

This suggestion seems to be borne out by Proclus' twofold division (*In Eucl.* 19.6 ff.) of the powers (δυνάμεις) of *dianoia*. On the one hand, there is the capacity for developing (προαγούσας) the principles into a plurality (εἰς πλῆθος) and of opening up multiform paths of speculation. But, on the other hand, it also has the power of gathering together (συναγωγούς) these many excursions under appropriate hypotheses (εἰς τὰς οἰκείας ὑποθέσεις). Proclus explains this double power of *dianoia* in terms of the intermediate position of its objects as follows: since *dianoia* is subordinate to the principles of the One and the Many, the Limit and the Unlimited, the objects which it grasps occupy a middle position between indivisible forms and sensible things which are completely divisible. Thus Proclus finds it plausible (εἰκότως) that the cognitive powers involved in the general science of such objects should also appear as twofold (διπλαῖ πεφήνασιν). First, there are the advances towards unity (εἰς τὴν ἕνωσιν σπεύδουσαι) involved in the gatherings (συμπτύσσουσαι) of the multiplicity that appears to us. Second, there are the divisions (διακριτικαί) of the simple into the diverse, of the more general into the more particular, and of the primary principles into secondary and more remote consequences. Here the language reminds one of the Platonic distinction between collection and division, but Proclus seems to be describing powers of the soul rather than methodical procedures. There is also a strong hint that he sees these as being merely two aspects of a single power which he calls *dianoia*. This is the capacity to move intellectually 'down' from principles to consequences and 'up' from multiplicity to a single principle.

According to Proclus (*In Eucl.* 19.20 ff.), the range of dianoetic thought extends all the way from the highest principles down to perceptible conclusions. At this lowest level it makes contact with nature and helps natural science to establish | many of its propositions. Correspondingly, it can rise [94]
up from this level and almost reach the level of intellect in its grasp of the primary principles. Thus, in its lower applications, *dianoia* 'projects' all of mechanics, along with optics and catoptrics, and many other sciences which are bound up with sensible things. In its upward paths (ἐν ταῖς ἀνόδοις), however, it grasps indivisible and immaterial insights (τῶν ἀμερίστων καὶ ἀΰλων νοήσεων) which perfect the partial knowledge gained through

discursive thought. For Proclus (*In Eucl.* 20.3–7) this is the way in which *dianoia* approaches the higher realities and exhibits some truth about the gods and the science of being. Here we find another piece of evidence for the influence of mathematical modes of reasoning on his conception of theology or dialectic.

But, of course, the most important evidence to consider is Proclus' own explicit discussion (*In Eucl.* 21.25 ff.) of the contribution of mathematics to all branches of philosophy, and especially to theology. According to him, mathematics prepares the mind for theology in showing by means of images (διὰ τῶν εἰκόνων) that apparently difficult and obscure truths about the gods are evident and irrefutable (ἀνέλεγκτα). For instance, it shows that numbers reflect the properties of transcendent beings (ὑπερουσίων), and it reveals the powers of the intellectual figures within the objects of the understanding. It is not at all clear what Proclus has in mind, even though he refers to Plato's many wonderful teachings (δόγματα) about the gods by means of mathematical forms. The possibility that he may be referring to some unwritten doctrines is opened up by his subsequent references to the secret theological teaching of the Pythagoreans, the so-called 'sacred discourse' (ἱερὸς λόγος)[15] attributed to Philolaus, and the treatise of Pythagoras on the gods. Apparently, all of these displayed the same tendency to clothe theology in mathematical garments, but we are not given any more information as to what precise form this took. In any case, given the Neopythagorean tendencies of Proclus himself, it is at least significant that he should cite these as precedents for his own approach to theology.

Another relevant, though indirect, piece of evidence to be considered is that to be found in Proclus' subsequent discussion (*In Eucl.* 22.17 ff.) of the contributions of mathematics to the science of nature (πρὸς τὴν φυσικὴν θεωρίαν). First, mathematics is held to be itself revealing (ἀναφαίνουσα) the orderliness of the ratios according to which the universe is constructed, and the proportion that binds things together in the cosmos. Given the Platonic character of such language, it is not surprising that Proclus refers to statements in the *Timaeus* (32c, 88e) about warring factions being made

[15] Morrow (1970: 19n42) notes that this ἱερὸς λόγος is cited frequently by Iamblichus in his so-called *Life of Pythagoras*, and by Syrianus in his commentary on Aristotle's *Metaphysics* (*In Met.* 10.5, 123.2, 140.16, 175.6 Kroll), and by a contemporary of Proclus, Hierocles of Alexandria, in his commentary on the *Carmen Aureum* 1.464 (Mullach ed.). Morrow (1970) speculates that these so-called 'sacred writings' may have been an invention of late Neopythagoreanism, though he does not dispute that Proclus takes them seriously. However, Mueller (1987) claims that, by contrast with Iamblichus, Proclus is relatively restrained in his appeals to Neopythagorean number mysticism.

into friends and sympathetic companions. As I have already pointed out, his acceptance of the Platonic approach to physics is the ground for his epistemological claim that mathematical thinking can travel from | the first [95] principles all the way down to the level of sensible things. It also relates to his second claim (22.22 ff.) about the contribution of mathematics to physics, namely, that it is showing (δείξασα) the simple elements as everywhere holding together in symmetry and equality. His third claim (22.26 ff.) is that it is discovering (ἀνευροῦσα) the numbers applicable to all generated things and to their periods of activity. This is what makes it possible for one to 'reckon up' (συλλογίζεσθαι) the fruitful and the barren times for each natural thing. Partly by way of justification for his claims, Proclus cites the fact that the *Timaeus* expounds (ἐκφαίνει) its theory of the universe in mathematical language. This is the precedent which explains his own attempt (in his *Institutio Physica*) to develop a physics in a syllogistic form that is inspired by the deductive model of the mathematical sciences.

From the point of view of my whole thesis, however, the most interesting feature of Proclus' first Prologue is his tendency to assume a continuous intellectual pathway for the ascent from particular mathematical sciences, through the portals provided by general mathematics and into the realm of being studied by dialectic. Towards the end of this Prologue, for instance, he explains (*In Eucl.* 44.11 ff.) that dialectic might be seen as a higher bond for the mathematical sciences because it completes general mathematics by making it steadfast (μόνιμον) and irrefutable (ἀνέλεγκτον), thereby showing that it is a true science. Here he sets an extremely high standard (even going beyond mathematics) for scientific procedure, which is reflected in his own construction of an unhypothetical *Elements of Theology*. But I think that the real ground for this theological science is to be found in his description (*In Eucl.* 44.15) of *Nous* as the highest bond for the mathematical science. Here *Nous* is described (*In Eucl.* 44.15–19) also as containing in itself all dialectical powers in a single form (μονοειδῶς), by reconciling (συνάγων) their variety through its simplicity (ἁπλότητος), their partiality through its indivisible insight (διὰ τῆς ἀμεροῦς γνώσεως), and their plurality through its unity (διὰ τῆς ἑνώσεως). Whatever this description may mean in detail, it shows that *Nous* is the ultimate terminus of the upward journey through the mathematical realm, and that its condensed contents must be discursively outlined through dialectical and general mathematical methods.

IV. *Geometry, Imagination and Intelligible Matter*

Proclus begins his second Prologue by examining the subject matter (ὕλη) of geometry, in order to see what rank (τάξις) it holds in the scale of things and what kind of being (οὐσία) it has. As in the first Prologue, he approaches the first question aporetically by listing objections to various views about the class of things studied by geometry. For instance, if one adopts the (Aristotelian?) view that the geometer talks about figures in the sensible world, this implies that geometrical objects are inseparable from matter (ἀχώριστα τῆς ὕλης). But (Proclus objects) if we accept this view, how can we say that geometry liberates (ἀπολύειν) us from sensible things, or converts (περιάγειν) us to the realm of bodiless existence, or accustoms us to the sight
[96] of intelligibles, or prepares us for activity in accordance | with *Nous*? Of course, this objection depends on the dubious assumption that Aristotle (or whoever holds the view) would also accept the Platonic claim about the function of geometry in turning the soul towards a higher intelligible realm.

The second objection also depends on the Platonic assumption that geometrical objects are not perfectly exemplified in the sensible world. Where among sensible things, Proclus asks rhetorically, have we seen the point without parts, the line without breadth, the surface without thickness, the equality of the lines from the centre? In general, the objection assumes that none of the polygonal figures as defined in geometry corresponds to the visible figures of this world. The basic Platonic assumptions that motivate the objector are evident also in the third objection which again takes the form of a rhetorical question: How can the propositions of geometry remain irrefutable (ἀνέλεγκτοι) when the figures and forms of sensible things are only more or less (μᾶλλον/ἧττον), when they are changing in every way because of the indeterminateness of matter (ἀοριστίας ὑλικῆς), when equality is linked with its opposite, inequality, and indivisibles parade themselves as divisible and extended?

But, on the other hand, if the objects of geometry are independent of matter (as Platonists tend to assume), and if its ideas are pure and separate from sensible objects, then none of them will have parts or body or magnitudes. By way of explanation for this objection, Proclus says that ideas can have magnitude, bulk, and extension in general only through the matter which is their receptacle.[16] Without some such matter it seems that

[16] This seems to refer to Plato's notion of a receptacle (*Tim.* 49a & 52a) which was interpreted in terms of matter (both sensible and intelligible) by Neoplatonists such as Plotinus and Porphyry; see Nikulin 1998.

we cannot bisect the straight line or the triangle or the circle; nor talk about differences between angles, nor about the increase and decrease of triangles and squares. The fact that these expressions are commonplace in geometry means for Proclus (*In Eucl.* 50.7–9) that its subject matter is divisible and that it does not consist of partless ideas. Furthermore, he appeals to the authority of Plato for calling geometrical forms understandables (διανοητά), while asserting that they incite us to turn from sensation to *Nous*, whose objects are indivisible and unextended, in keeping with the unique character of the soul. So, as usual, Proclus declares his intention of formulating a theory which agrees (συμφώνους) both with the facts (τοῖς πράγμασιν) and with the teachings of Plato.

By way of preparation for his own solution, Proclus outlines all the possible modes of being of a universal with respect to particulars: (i) either it shows itself in the particulars and has its existence in them, being inseparable (ἀχώριστον) from them so that it moves when they move and rests when they rest; (ii) or it exists prior to the many (πρὸ τῶν πολλῶν ὑφεστάναι) and produces plurality by offering its appearances to the many instances, while itself remaining indivisible above them; (iii) or it is formed from particulars by reflection (κατ' ἐπίνοιαν) and has its existence as an after-effect (ἐπιγεννηματική), as a later-born addition to the many. Having outlined these three incompatible modes of being, Proclus says (*In Eucl.* 51.8–9) that some universals are prior to their instances, while others are in their instances, and again others are constituted by virtue of being related to particulars | as their [97] predicate (κατηγορίαν). For once, it seems that here he may be searching for a compromise between Plato and Aristotle on the status of universals.[17]

Proclus is also taking a lead from Aristotle in claiming that there are differences in the underlying matter corresponding to the difference between sense objects and objects that have existence in the imagination. In this context, he cites Aristotle's distinction (cf. *Met.* 1036a9–12) between sensible and intelligible matter, which (latter) Proclus identifies with the matter of imagined objects (ὕλη τῶν φανταστῶν). He makes a correlative distinction between two kinds of universal, one of which he calls 'perceptible' (τὸ αἰσθητόν) since it is participated in by sense objects, and the other 'imaginary' (τὸ φανταστόν) because it exists in the plurality of pictures in the imagination. His explanation goes as follows:

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[17] Syrianus (*In Met.* 91.20) seems to have introduced a similar distinction between the universal which is the cause of the sensible, and the universal which is generated as posterior to the sensible.

> For imagination, both by virtue of its formative activity and because it has existence with and in the body, always produces individual pictures that have divisible extension and shape, and everything that it knows has this kind of existence. (*In Eucl.* 51.20–52.3)

In support of this view of imagination, Proclus links it with Aristotle's notion of passive *Nous*, which is assumed to have been deliberately posited in a middle position between the highest and lowest knowledge. His forced interpretation of Aristotle is interesting in many ways, not least as an example of Proclus' own tendency to insert intermediate entities wherever possible. His argument is that impassivity and immateriality belong to pure *Nous* and to the intellectual nature, whereas whatever can be affected belongs to body in the lowest position. As a middle term between these extremes, Proclus thinks that Aristotle inserted passive *Nous*, which resembles the highest things in its noetic aspect, and the lowest things in its passive aspect. He explains that the highest form of knowing is identical with the intelligible objects which *Nous* contains in itself without any shapes or figures. By contrast, the lowest form of cognition works through the sense organs and is similar to affections in that it receives impressions from outside and changes along with these. So, according to Proclus, imagination occupies an intermediate position in the scale of knowing and is moved by itself to 'project' (προβάλλει) what it knows. However, since it is not separate from the body when it draws out (προάγει) its objects from the undivided centre of its life, it expresses them in the medium of division, extension, and figure (μερισμόν, διάστασιν καὶ σχῆμα).[18]

For this reason, he explains, everything that imagination thinks is a picture or a shape of its thought, e.g. it thinks of the circle as extended (διαστατῶς), which is a kind of intelligible matter (νοητὴν ὕλην) provided by the imagination itself. By way of evidence for such an account, he argues that this is why there is more than one circle in the imagination, just as there
[98] is more than | one circle in sensation, since it is only with extension that there appear to be differences in size and number among circles and triangles. Here Proclus rests his case upon a parallel between the embodiment of the universal circle in sensible and intelligible matter. Just as sensible circles depend upon sensible matter, so also imagined circles have their existence

[18] One possible influence on Proclus with regard to imagination is Plotinus, who also made it an intermediate faculty that has contact both with sense perception and with the discursive faculty of *dianoia* (*Enn.* II.9.11.22; IV.4.13.11–13). Indeed, Plotinus seems to make a distinction between two different imaginations, a higher and a lower, which parallels the distinction between intelligible and sensible matter.

(ὕπαρξις) in a single immaterial substratum (ὑποκειμένῳ ἀΰλῳ) and hence their life depends on a simple body (σώματος ἁπλοῦ) that is different from indivisible being by virtue of extension. Proclus argues for two types of instantiation of the universal, i.e. in sense objects and in the objects of imagination (ἐν τοῖς φανταστοῖς). So he concludes that the *logos* of the circle (ὁ κυκλικὸς λόγος) is of two kinds: one kind presiding over intelligible matter (ἐπὶ τῆς νοητῆς ὕλης), the other over perceptible. Prior to both is the *logos* in the understanding (ὁ ἐν διανοίᾳ λόγος), and the *logos* in nature (ἐν φύσει), since the former is the support for imagined circles and the latter for perceived circles, whether in the heavens or in things generated by nature.

But the *logoi* themselves that preside over the understanding and nature are undivided, since extended things exist without extension in the realm of immaterial causes (ἐν ταῖς ἀσωμάτοις αἰτίαις). Thus, for instance, the circle in the understanding (ὁ ἐν διανοίᾳ κύκλος) is one and simple and unextended, because objects in the understanding are devoid of matter (ἄνευ ὕλης). By contrast, the circle in the imagination is divisible and extended, as a form instantiated, while the circle in sensible things is inferior in precision, infected with straightness and falling short of the purity of immaterial circles. Hence, Proclus concludes, when the geometer says something about the diameter of the circle or about tangents or segments, he is not talking about sensible circles because he 'separates' (χωρίζειν) from them, nor about the circle in the understanding because that is unique and indivisible. So he must be studying the universal which is present in imagined circles. Although the understanding contains such ideas, it is unable to 'see' them without unfolding them and exposing them to the imagination which is 'sitting in the vestibule' (ἐν προθύροις κειμένην). Therefore, with the aid of imagination, understanding can explicate its knowledge of geometrical universals, since the matter of the imagination is a receptive medium which is relatively free from the distorting effect of sensible matter.[19]

We can confirm that Proclus has adopted a compromise view on geometry by comparing it with his report (*In Eucl.* 77–79) of a dispute between the followers of Speusippus and Menaechmus on the role of motion in geometry. On the one hand, Speusippus denied the existence of problems in the strict sense of 'things to be done', and insisted that all geometrical propositions should be regarded as theorems because they involve the contemplation of eternally true and unchanging objects. Of course, he admits that the construction of geometrical objects may be necessary, but only for the sake

[19] See also Syrianus, *In Met.* 91.29–34.

of understanding these eternal things by treating them 'as if' they were in the process of coming to be. Thus Speusippus seems to have adopted an interpretation of geometrical activity which was similar to Xenocrates' interpretation of Plato's account of the generation of world-soul in the
[99] *Timaeus*. Since the world-soul is eternal, just like geometrical forms, it must | be the case that all talk of generation or of construction is for the sake of explanation, and so cannot be taken literally.

It was Aristotle among others who took Plato's words literally, and on this basis mounted his objections against the generation of what is eternal (*De Caelo* 279b17–31). Similarly, the followers of Menaechmus, the mathematician, interpreted geometrical construction literally, and so claimed that all geometrical propositions are problems, presumably because they involve the construction of geometrical objects. By way of resolution for this dispute, Proclus proposes a classic Aristotelian compromise by saying that both are right in a way. The school of Speusippus are right in insisting that geometrical problems are not mechanical problems that deal with perceptible and changing objects. On the other hand, however, the followers of Menaechmus are also right because the discovery of theorems is not possible without recourse to intelligible matter. Proclus hastens to explain that it is plausible to talk about acts of production because the *logoi* proceed into this matter and shape it. In effect, the movement of our thought in projecting its own *logoi* involves the production of figures in our imagination. While the contents of our understanding (the *logos*) stand fixed, without any generation or change, it is in the imagination that the constructive activities of geometry take place. For Proclus such a solution is consistent with his own ontological hierarchy, precisely because it is at the level of Soul that the projective activity of imagination takes place, so that it reflects as images the immobile Forms in Intellect.

In this light, we can now clarify the views of Proclus on the ontology and epistemology of geometry. He claims (*In Eucl.* 55.5) that thinking in geometry happens with the help of imagination (φαντασία), e.g. that its synthesis and divisions of figures is imaginary. Therefore, its mode of knowing (γνῶσις) never reaches understandable being (διανοητικὴ οὐσία) because understanding (διάνοια) is looking at things outside itself. But Proclus insists that the understanding can see such things only by virtue of what it has within itself, which it spontaneously makes external through employing projections (προβολαῖς). This implies that, if it could ever roll up (συμπτύξασα) its extensions and figures so as to view their plurality as a unity without figure, then in turning back to itself (πρὸς ἑαυτὴν ἐπιστρέψαι) it would obtain a superior vision of the partless, unextended and essential (οὐσιώδεις) ideas

that constitute its full complement (πλήρωμα). Here Proclus seems to refer to a higher science that also seems to be envisaged in Plato's *Republic*:

> Such an achievement would itself be the perfect culmination of geometrical inquiry, truly a gift of Hermes, leading geometry out of Calypso's arms, so to speak, to more perfect intellectual insight, and emancipating it from the pictures projected in the imagination. (*In Eucl.* 55)

Such philosophical geometry would seem to be the goal of Proclus when he advises every 'true geometer' (ἀληθῶς γεωμετρικόν) to make the move from imagination to pure and unalloyed understanding (διάνοια), thereby freeing himself from 'passive *nous*' (παθητικὸς νοῦς) for the dianoetic activity (ἐνέργεια) that will enable him to see all things without parts or intervals, e.g. both the circle and each of the polygons in the circle separately.

Conclusion [100]

From our modern point of view, Proclus seems to be proposing something analogous to analytic geometry in which spatial figures can be studied in some non-spatial fashion. As evidence that such partless ideas exist in and through one another, he cites the fact that, even in our imagination, we show circles as inscribed in circles and vice versa. But if such a pure analytic science is possible, it is natural to ask why we need diagrams to illustrate the structure and construction of figures. Proclus answers that we need the imagination and the intervals that it provides, since the form itself is without motion or genesis, indivisible and free of all underlying matter. Yet he insists that it is the elements latent in this form which are produced distinctly and individually on the screen of imagination. The projector (τὸ προβάλλον) of the images is the understanding (διάνοια), while the source (ἀφ' οὗ) of what is projected is the form in the understanding (τὸ διανοητὸν εἶδος), and what they are projected in (ἐν ᾧ) is the imagination which Proclus calls 'passive *nous*' (παθητικὸς νοῦς).

With specific reference to Porphyry's commentary on Euclid, Proclus seems to be critical of the former's acceptance of abstractionism, when he claims (56.23 ff.) that his own approach is more in agreement with the principles of geometry and with Plato's supposed claim that the objects of geometry are 'understandables' (διανοητά). He thinks that his own view 'harmonises' (συνάδει) with that of Plato because the geometrical forms pre-exist (προυφεστήκασιν) in the understanding, even though they are projected (προβέβληται) in the imagination as divided and compounded figures. This attempted reconciliation may be an implicit admission by Proclus that his

views about geometrical objects represent a development beyond Plato and perhaps even beyond the previous Platonic tradition.

I think it is clear, for instance, that Proclus is going far beyond Plato's text when he expounds the doctrine of mathematicals as projections by the understanding on the screen of mathematical space.[20] Yet his exposition shows that the problem about the mode of being of mathematical objects was still very much alive for Neoplatonic thinkers concerned about the foundations of mathematics. But, more importantly for our historical understanding, it illustrates the cosmological and metaphysical framework within which the issue is formulated. For instance, Proclus viewed the cosmos of mathematics as a replica of the whole of being whose complex structure consists of a fundamental One and an indefinite Many.[21] In fact, he treated Euclid's *Elements* as a cosmological treatise in the Platonic mode, since it concludes with a construction of the five regular solids which are so prominent in the
[101] *Timaeus*.[22] While this is certainly going too far, I do not | accept Morrow's judgment that it is completely erroneous, given the cosmological function of mathematics in the *Timaeus*.

[20] *In Eucl.* 51–56.
[21] Cf. Morrow 1970: xxxviii.
[22] *In Eucl.* 68.21–23,70.19–71.5,82.25–83.2.

HISTORY OF PHILOSOPHY

A. *Plato*

Introduction

In *De Caelo* I, Aristotle makes it clear that not only in cosmology, but also in physics and mathematics, the choice between the finite and the infinite determines his whole system, just as a first principle dictates its consequences. In the case of Plato also, we find a similar choice about the basic structure of matter being made in the *Timaeus*, where he parts company with the Atomists on the question of infinity, while accepting their conception of matter as discrete rather than as continuous. By contrast with Aristotle who treats matter as a continuum, Plato sees it as being constituted from basic triangles as discrete units, although these are regular in shape and finite in number, unlike the irregular infinity of atoms. If matter were left to its own devices, Plato seems to say, it might behave in a random and mechanical fashion, but that would not explain the order of the visible cosmos.

I. *Things That Happen of Necessity*

The first part (27–47) of the *Timaeus* explains such rational order in terms of a divine craftsman who generates the cosmos as a living creature with a soul and body, both of which are constructed according to the most perfect numerical proportion. By contrast with the infinite universe posited by the Atomists (DK 67A1, 68A40), Plato's universe is a finite sphere whose complete rationality is reflected in its circular motion on a central axis. Yet the so-called 'wandering cause' is also admitted into this universe, when Timaeus describes (48a ff.) the visible cosmos as being generated through Reason persuading Necessity to aim at what is best.[1]

In order to account for that refractory aspect of an ordered universe, [240] Timaeus proposes (48b3 ff.) to investigate the nature of the four elements, as

[1] The role of Necessity (ἀνάγκη) in the cosmology of the Atomists is well attested: see Diogenes Laertius IX. 45; Aetius I. 26. 2. For chance in their cosmogony see Aristotle, *Physics* II, 4, 196a24, Aetius I, 25, 4; Sextus, *adv. math*. vii, 117; Simplicius, *In Phys*. 327, 24.

they were *before* the generation of the cosmos. He complains that no one has so far explained the generation of these elements, even though some people call such things 'principles' and posit them as 'elements' of the universe. Here Plato appears to have in mind those *phusiologoi* who treated one or other of the four elements as first principles, especially when he criticises as shallow word-play the comparison with letters (στοιχεῖα) which are compounded to form syllables and words. In fact, Democritus (DK 67A6, A14, 68A37) may have used the Greek alphabet to illustrate how a great variety of things can be generated from various combinations of atoms with void spaces between them.

Timaeus rejects all such comparisons and proposes a different method, while invoking (48d–e) divine help in finding a safe passage 'out of a strange and unfamiliar narrative' to a likely conclusion. This traditional invocation suggests that his narrative is competing with the more familiar accounts of the *phusiologoi* and that it is superior to their superficially plausible stories. It is described as a new type of account presumably because it involves Plato's novel application to the physical world of mathematical discoveries made by Theaetetus.

II. *The Receptacle*

Furthermore, Timaeus (48e) says that, in addition to the paradigm and its image, he must clarify an obscure third kind of entity. His introduction of a receptacle as 'nurse' for all generation is reminiscent of the *phusiologoi* who use matter as a principle of explanation. However, as he points out (49b3–5), if generation is always going on in the receptacle, it will be difficult to distinguish between the four elements or to give them definite names. This undermines the position of *phusiologoi* like Empedocles who used the four elements as ultimate explanatory factors in their cosmologies. The point is that if none of them ever remains the same in appearance, they cannot be given fixed names that identify them as permanent subjects; so that one should never describe any of them as 'this' (τοῦτο) but rather as 'suchlike' (τοιοῦτον). The reason why one should not refer to any element by means of a term like 'this' (τόδε) or 'that' (τοῦτο) is that one would be assuming something definite (τι) as a referent. But there is no such fixed referent among the sensible phenomena because no element remains stable for names like 'this' and 'that', which designate beings in themselves. Thus the Empedoclean elements are designated as 'suchlike' things because they are continually whirled around in a circle of generation and corruption. Indeed, the only

thing legitimately designated as 'that' or 'this' is that thing 'in which' (ἐν ᾧ) they appear when generated, and again that 'from which' (ἐκεῖθεν) they disappear when they perish.

For us there is a natural temptation to describe the receptacle in Aristotelian terms as the material substratum for the changing contraries that are associated with the four elements. This seems to be confirmed at 50a2–5 by the selection of contrary qualities like 'hot' or 'white' to illustrate 'suchlike' (ὁποιονοῦν) things that should never be designated as 'this' or 'that'. Here Plato appears to | be criticising previous *phusiologoi* like Anaximenes (DK 13B1) [241] and Anaxagoras (DK B8) who treated 'the hot' and 'the cold' as independent though correlative powers, manifested through action on other things. Yet it is doubtful whether the receptacle is a material substratum like Aristotle's prime matter, given that at least one of their defining characteristics is quite different. For instance, prime matter is that 'out of which' the composite material substances are generated through the agency of appropriate forms; whereas the receptacle is always that 'in which' sensible properties make their appearance. Just like the Forms which these properties imitate, the receptacle itself has an unchanging nature, though it seems to lack their intelligibility.

In an attempt to clarify the nature of this mysterious entity, Timaeus invites his audience to imagine a situation in which someone first moulds all sorts of figures out of gold and then remoulds each of these figures again. Given this hypothetical situation, if someone pointing to one of these figures were to ask about what it is, then the safest answer would be to say that it is gold. Since the 'what is it?' question begs an answer in terms of real being, it would be misleading to describe the triangular shape or any of the other shapes of gold as true beings because they are changing even while one is describing them. By contrast, the receptacle must always be called by the same name because it never diverges from its own capacity, which is to receive things without permanently adopting the shape of anything entering it. Its nature is that of a moulding-stuff that is changed and transfigured by the things entering into it, so that it appears different at different times (50b–c). Thus the relevant point of the gold-analogy is that the receptacle is an indeterminate though permanent medium, which is capable of receiving the images of transcendent Forms.

In summary, the 'likely account' involves three distinct kinds of thing: (i) that which is generated; (ii) that in which things come to be; (iii) that from which the generated things are copied. By contrast with generable things, the room in which they appear is everlasting and does not admit of destruction, yet it beggars belief because it must be grasped without the senses by a sort of

illegitimate reasoning (λογισμῷ τινὶ νόθῳ, 52b3). It is described as something we dream about when we assume that nothing exists unless it is in some place and occupies some room, whether on earth or in the heavens. Since Forms would not even exist according to this criterion, Plato may be citing the axiom of Zeno (DK 29A24), who assumes (possibly for the sake of argument) that everything which exists is somewhere. We might also treat it as an ironical reference to those *phusiologoi* who admit the existence only of things which occupy some place or room or void.

But how are we to understand the so-called 'bastard reasoning' by means
[242] of which space is cognitively grasped?[2] Perhaps it is a type of reasoning that | illegitimately combines reason and opinion, given that its proper object (i.e. the receptacle) is indestructible like the Forms. Yet the receptacle and the Forms must be different because when one real entity is distinct from another, neither of the two can ever come to exist in the other because that would involve the same thing being both one and two simultaneously. Plato seems to mean that, in contrast to the Forms, the receptacle is both one and two, since it receives the images of the Forms while retaining its own nature as an all-receptive medium. Within the historical perspective of the Parmenidean challenge faced by Greek cosmologists, I suggest that the receptacle is Plato's alternative to the Atomist void, as a plenum in which change and movement can happen without the introduction of absolute non-being.[3] It serves the same logical and ontological function as the material substratum in Aristotle, who therefore tends to see the receptacle in terms of his own concept of matter.[4]

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[2] Democritus (DK B11) also distinguished between legitimate (γνησίη) and bastard (σκοτίη) cognition, i.e. knowing through the intellect is legitimate, whereas cognition through the senses is dark or unclear. It seems that the reason why the senses are described as 'dark' (σκοτίη) is that they cannot see beyond a certain limit into the microcosmic world, whereas intellect can reach into this 'finer' (λεπτότερον) realm. But this does not correspond very well to Plato's more complex distinction, which finds a better parallel in Aristotle's view that matter can only be known by analogy since it is grasped by stripping away all categorial forms; cf *Met*. 1029a11–25. Plotinus (II.4.10 & 12) also thinks that Plato is talking about how matter as an indefinite thing can only be grasped by negative abstraction.

[3] David Sedley (1982: 188) has suggested that there is some similarity between Plato's depiction of space in the *Timaeus*, and the Epicurean notion of intangible extension which is called void, place, and room within different contexts, e.g. 'void' when it is not occupied, 'place' when it is occupied, and 'room' when bodies move through it without resistance.

[4] In *Metaphysics* VII, 3, for instance, Aristotle says that one will end up identifying matter as the primary substance, if one pushes to its logical conclusion the method of 'stripping off' the qualitative and quantitative attributes of things. Subsequently, he describes matter *per se* as bereft of all positive and negative attributes, and this is very reminiscent of Plato's description of the receptacle.

III. *Generation in the Receptacle*

Along with Form and copy, Timaeus lists the receptacle as another prerequisite for the generation of the visible universe. It exhibits every variety of appearance, being liquified and ignited, while also receiving the shapes of earth and of air, and their affections (52d5–7). The receptacle is shaken unevenly because it is filled with 'powers' which are dissimilar and unbalanced, and which thereby induce in it a swaying motion which, in turn, shakes the contents just like a winnowing-basket. Elaborating on the simile, Timaeus says (52e6–8) that such shaking is responsible for the separation of unlike kinds, just as wheat and chaff are separated because of the difference in their solidity and weight. The whole description is reminiscent of accounts of generation given by natural philosophers in terms of the motion of a vortex separating things according to the principle of like to like.[5] For instance, Democritus (DK 68A37) posited the dissimilarity | of atoms as a [243] cause of their random motion, whereas 'like to like' is taken as a principle for sorting them into different regions so as to generate compound bodies both on the earth and in the heavens.

In the same way, Timaeus gives a preliminary account of why the so-called 'four kinds' were already separated off into different regions before the generation of the cosmos. Even though these four elements already had some traces (ἴχνη) of their true nature, they were in the sort of chaotic condition that one might expect in the absence of divine intelligence (53b2–4). The latter may be taken as a critical remark aimed at previous thinkers who postulated the random and mechanical generation of the four elements by means of a vortex. It also implies that the subsequent mathematical ordering of things is due to divine intelligence, as witnessed by the remark (53c4–5) about the god taking them over in their chaotic condition and arranging them with respect to forms and numbers. Furthermore, Timaeus emphasises that the god strives to make his construction as beautiful and as good as possible, despite the initial lack of order and beauty. This passage suggests that the mathematical structuring is part of the divine activity of persuading Necessity to lend itself to the production of the best order in the world. All of these preliminary remarks prepare the way for a new account of the ordering of each of the elements that is taken over in a disordered state. Timaeus warns

[5] Empedocles (Fr. 360KR) and Democritus (DK 68A40) both are credited with positing the vortex to explain the separation of like elements into different regions, and it seems that Anaxagoras (DK 12) also accepted the same mechanism for separating things out.

his audience that the account will be unfamiliar to those unacquainted with certain 'ways of learning', which presumably include the solid geometry of Theaetetus.

Timaeus begins (53c4 ff.) his new account by taking for granted that fire, earth, water, and air are bodies whose form involves depth. From these obvious facts he goes on to argue that, in every case, depth is necessarily bounded by surface, and that every rectilinear surface is composed of triangles. Interpreted geometrically, this means that triangles are prior in analysis as the limiting surfaces of solid bodies. These surfaces must be composed of a number of triangles, since in Euclidean geometry the triangle cannot be decomposed into more elementary shapes. Of course, in some logical sense the line and the point are prior to the triangle, and similarly for a solid the bounding surface can be seen as prior because the notion of a solid presupposes some boundary.[6] In a more material sense, however, the rectilinear surface of a regular solid is posterior to the elementary triangles out of which it is composed because the area of any plane surface can be calculated as the sum of such triangles. Therefore, another way of restating the conclusion of Timaeus' argument is to say that triangles are materially prior to surfaces and to solids, in turn. We know from the reports of Aristotle (*Met.* 1017b17–20, 1019a1–4) that Plato himself attached ontological significance to both types of priority.

One implication may be that, if we use priority as a criterion of reality, the elementary triangles will be more real than the solids which are perceptible to the senses. A strict application of that criterion, however, also implies
[244] that such | triangles cannot be the ultimate principles since they themselves presuppose lines and points. Thus Timaeus hints (53d–e) at higher principles which are known only to the god or to humans who are divinely inspired. But he does not pursue any further the inquiry into these principles because the method of plausible reasoning combined with necessity allows him to posit less than ultimate principles for his inquiry into the nature and genesis of the traditional four elements. Here there is a compelling parallel with the application of mathematical hypotheses to the famous astronomical problem about the real movement of the so-called 'wandering stars'. Timaeus seems to be adopting a similar approach when he posits the half-square triangle as the basic principle for earth and the half-equilateral for the other elemental bodies. Furthermore, the parallel with mathematical construction

[6] In Plato's Academy the schema of point, line, plane, and solid, served as a paradigm for natural priority, dictated by the criterion of non-reciprocal dependence; see Cleary 1988.

is appropriate because the 'generation' of eternal elements may be taken as metaphorical in both cases. Just as mathematicians 'generate' mathematical objects out of more primitive elements for the purpose of analysis and instruction, so also Timaeus will 'construct' the elemental bodies out of primitive triangles in order to instruct his listeners about the underlying mathematical structure of matter.[7]

In a short argument (53c–d), Timaeus moves rather too quickly from the obvious fact that sensible bodies are three-dimensional to the postulation of triangles as their basic principles. When he introduces (53d1 ff.) two kinds of triangle as basic, he claims that all other triangles are derived from them, even though it is hard to see how every scalene triangle must be derived from either the half-equilateral or the half-square triangles. Yet, from the point of view of constructing the regular solids, the claim makes good sense because the faces of these figures (e.g. pyramid, cube, etc.) are either equilateral triangles or squares. When viewed from such a perspective, his choice appears to be dictated by the character of the solids which Timaeus wishes to construct, and it renders intelligible his selection of a half-equilateral scalene over many other types of right-angled scalene triangles.[8]

However the choice of basic triangles is largely dictated by the nature of the problem which Timaeus has set out for himself, namely, what structure can be attributed to the four elementary bodies such that they can be generated from one another through dissolution. Just as one does in the process of analysis in geometry, | Timaeus works back from the conclusions he wants [245] proved to the assumptions he will have to make. Within these terms of reference, it is clear that Plato has already decided to identify the traditional four elements with four of the regular solids. Thus the problem is one of trying to construct these solids from basic triangles in such a way that the phenomena of transformation between the elements are preserved. As a result, Timaeus rejects (54b–d) the initial appearance that *all* the elements

[7] In *Metaphysics* XIV, 3, 1091a12 Aristotle complains about the tendency of Pythagoreans like Philolaus to speak of 'generation' with respect to eternal things. For instance, they say that when the one has been constructed (leaving unclear whether it is out of planes or surface or out of seed) then the nearest part of the unlimited is drawn in and limited by the limit. Even if this report is an Aristotelian distortion it still gives us some glimpse of a possible historical inspiration for the *Timaeus*.

[8] Popper (1945: 251) conjectures that Plato's choice of triangles is dictated by the fact that their hypotenuses represent $\sqrt{2}$ and $\sqrt{3}$, respectively, which he may have regarded (mistakenly) as basic elements for the construction of all other irrational numbers. But this conjecture would be beside the point if, as Pohle (1973: 312) suggests, the basic triangles are arbitrarily small and non-dimensional units from which the perfect solids are constructed as the invisible structure of perceptible elemental powers.

can be transformed into one another, since his mathematical constructions dictate that he choose two different kinds of basic triangle. While the tetrahedron, the octahedron, and the icosahedron can all be constructed from half-equilateral triangles, one needs the half-square triangle to construct the faces of a cube. So geometrical considerations dictate that the element earth, which is identified with the cube, cannot be transformed into the others. This is a typical example of the *a priori* mathematical approach which Aristotle severely criticises as a method of physical inquiry.[9]

After giving these general hints about the transformation of the elements, Timaeus (54d–e) undertakes to explain the form in which each of them has been generated and the *numbers* from which it is compounded. The pyramidal form is identified as primary, presumably because it has the least number of component triangles. The triangle which functions as an element (στοιχεῖον) here is the half-equilateral with its hypotenuse twice as long as its least side. A pair of these put together along the diagonal yields an equilateral triangle, but this does not yet constitute one face of the tetrahedron that is being constructed. Given that the sides of a pyramid are equilateral triangles, it seems rather strange that the most basic pyramid should be overlooked, but considerations of geometrical symmetry may be responsible for the more complex construction. Here Timaeus merely asserts that one face of the pyramid is generated from three such equilaterals, fitted together at their vertices around a single centre. Thus a single face of the tetrahedron is compounded from six of the basic half-equilateral triangles, and when four of these sides are fitted together into a pyramid, the latter will be constructed out of a total of twenty-four basic triangles.[10] Similarly, the octahedron is analysed into the same half-equilateral triangles but involves more of them in its construction. Since this second solid has eight sides, each of which is an equilateral triangle constructed from six half-equilaterals, its whole composition will contain forty-eight basic triangles. In the same way, the
[246] icosahedron is | composed of one hundred and twenty elementary triangles, with each of its twenty sides being put together from six half-equilaterals.

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[9] Cf. *De Caelo* 306a2 ff. Vlastos (1975: 81 ff.) challenges Aristotle's critique on the grounds that no observable phenomena were available to the Greeks that could falsify Plato's hypothesis. But surely the nub of their dispute is the legitimacy of drawing on mathematical principles to explain physical phenomena. On this point, Aristotle held Democritus to be superior to Plato, presumably because he posited physical solids (i.e. atoms) as principles, rather than geometrical planes. However, the Democritean account (DK 68A37) flouts all canons of parsimony by attributing an indefinite number of both regular and irregular shapes to the basic atoms.

[10] See Vlastos (1975: 77) for the relevant diagrams and explanations of these constructions.

Timaeus simply declares (55b5ff.) that the first of the basic elements ceased to be active when it had generated these three solids, since the nature of the fourth solid is generated from the half-square isosceles triangle. Four of these triangles are similarly combined, with their right angles fitted together around a central point, to form a square. If we put six of these squares together at right angles to one another, we can construct a cubical body that has eight solid angles. Of course, just like the previously constructed solids, this cube will be shaping up the characterless receptacle by means of its plane sides, as these passages seem to suggest. We cannot read too much into such primitive constructions, however, since Timaeus is primarily concerned with the shape of the 'bodies' that are constructed. In this light, perhaps, we may see some point to Aristotle's complaint that an excessive concern with mathematical form leads Plato to neglect the material principle of physical bodies.[11] But the construction of the cube in the *Timaeus* is not strictly mathematical, unlike the constructions of the five regular solids found in Euclid's *Elements* Bk. XIII. Indeed the constructions for all the elemental solids are more like empty three-dimensional models, though the question about their material content is left rather vague by Plato, as Aristotle's criticism shows.[12]

Conclusion

In a brief interlude (55c–d), Timaeus concedes that some people may be at a loss (ἀποροῖ) to know whether an infinite (ἀπείρους) or finite number of universes should be posited. But any good calculator should reckon that the thesis about infinite universes must be that of someone who is inexperienced (ἀπείρου) in matters in which he ought to be experienced (ἔμπειρον). While the elaborate word-play here is obviously intended to discredit some hypothesis about infinite *kosmoi*, it is unclear whether the Atomists are the targets of this derisive put-down, though such derision

[11] In this regard, Schulz (1966: 65–86) claims that Plato does not neglect matter but rather reduces it to geometrical shapes in the receptacle, by virtue of reducing all sensible characteristics of material body. Just as in the Atomist reduction, what is irreducibly real is the figure, ordering, and motion of the basic triangles, which are strictly two-dimensional by contrast with three-dimensional atoms.

[12] In *De Caelo* IV, 5 as part of his critique of previous theories of weight, Aristotle assumes that Plato posited a single matter (μία ὕλη) for all the elemental bodies, namely the triangles (τὰ τρίγωνα), though he is well aware of the fact that two different kinds of triangle had been posited. In view of Aristotle's identification of the receptacle with matter elsewhere, perhaps this is the single matter which is shaped by different kinds of triangle to yield the basic units for the construction of the elemental solids.

would be consistent with Plato's general attitude towards all those *phusiologoi* who succumbed to the indefinite and thereby failed to give economical and
[247] intelligible explanations. It also throws | some light on why he takes more seriously the question of whether there are five universes, each of which presumably has a different shape corresponding to one of the five perfect solids. As far as we know, this is a purely fictional hypothesis but it is taken seriously because it involves a definite number of universes, by contrast with the Atomist hypothesis about an infinite number. Consistent with his method of giving a plausible account, Timaeus asserts that the universe is single by nature, even though he concedes that someone else may reach a different conclusion by considering other factors. This approach should be compared with 31a where the question of whether the universe is one or infinite is decided by means of a logical argument that shows it to be unique like its paradigm because both share the character of being all-inclusive.[13] Perhaps such *a priori* argumentation lies behind the assertion that the universe is single by nature, yet the possibility of five distinct universes is not ruled out because that might also be intelligible. What would be unintelligible and, therefore, unacceptable is that there should be an infinity of universes.

[13] Parry (1991) has shown how the argument for uniqueness based on all-inclusiveness can be related to the way in which the five perfect solids are circumscribed by a sphere. This is consistent with the spherical shape earlier (33b–c) assigned to the universe, but it might conflict with 55c which seems to assign the dodecahedron to the whole universe.

Introduction

In this paper I focus mainly on *Laws*, Book X, although one cannot understand its apparent digression on atheism without reference to the whole work. As P. Shorey (1914: 369) suggests, Book X may be read as a belated preamble to the *Laws* itself, since it fulfils its functions of persuasion and exhortation. It is significant that the first word of the *Laws* is *theos*, and that the first question is whether a god or some man is the source of the Cretan laws;[1] that is the implicit question being posed throughout the work about the legislation for Magnesia. In ancient Greece it was usual for some wise man to be called upon to draw up a constitution for a new colony. This is one of the problems with which Plato is concerned in many of his dialogues, but especially in the *Laws*.

One general function of theology in the *Laws* is to provide a metaphysical and cosmological foundation for human laws, which overturns the sophistic distinction between *nomos* and *phusis*. In this way Plato can be regarded as one of the founders of the natural law tradition. However, in *Laws* X the purpose of its theological argumentation is to set up for law-abiding citizens as an ideal goal the imitation of divine rationality; another version of the Platonic ideal of *homoiôsis theôi*. Any citizen who can attain such a rational understanding of how the system of laws reflects the rational structure of the cosmos will be both virtuous and happy because it is precisely this connection that is underwritten by the gods. In this way Plato resolves one of the deepest problems of ethics, namely, the apparent disjunction between virtue and happiness.

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[1] This theme is underlined by the dramatic situation of the *Laws*, which has three old men making a pilgrimage to the cave of Zeus near Knossos in Crete where, according to the myth, Minos received the laws of Crete from Zeus. Subsequently in the *Laws*, Zeus is mentioned frequently as the highest of the Olympian gods who holds everything else in his power. Plato's references to the 'golden cable' of reason are reminiscent of the famous boast of Zeus in Homer *Iliad* VIII, 18–27 that he could drag all the other gods up to Mount Olympus on a golden cable.

[126]

I. *The Threat of Impiety and Atheism*

It is not very clear what exactly the rationale and provenance were for legislation against impiety in ancient Athens, as it seems to have been used politically to target prominent intellectuals such as Anaxagoras and Socrates. Given Plato's defence of Socrates in the *Apology*, it is both ironic and significant that he himself should insert into the constitution of Magnesia legislation to combat impiety, atheism and the corruption of the young.[2] Some historical examples of impiety, as the case of Alcibiades, may still be present in Plato's mind.

Book IX of the *Laws* sets out detailed legislation to deal with all types of injustice and outrage, and the tenth book continues with a universal principle of law to cover all cases of violence. There follows a classification of other outrageous acts, whether by thought or word, which are ranked according to their gravity. First, the most grave acts are the licentious and outrageous acts of the young, especially when directed against the public objects of worship. Next come offences against the private ones, and third come offences against parents and elders. Whoever acts impiously must be suffering from one of the following pathologies of mind: (l) he does not believe in the gods; (2) he believes the gods exist but take no care for human affairs; or (3) he believes they can be bribed with prayers and offerings. The diagnosis of the causes of these mental pathologies and the legal prescription for their cure occupy the greater part of Book X, and supply the general context for the elaboration of Plato's theology.

The first task of the lawgiver is to persuade the wrongdoers, corrupted by popular religious myths, through such arguments as one finds in the lawcourts. This task fits with the function of preambles to the law, which is to exhort the citizens to be virtuous. Indeed Book X consists largely of an elaborate prelude to the laws governing impiety, which is out of all proportion to the number of these laws. By contrast with previous preambles in Books IV–V, for instance, Plato does not begin with a myth or a proverb but instead gives an *epideixis*, presumably because he is dealing with sophistic atheists who do not believe in myths, but who might be persuaded by naturalistic arguments.

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[2] T.J. Saunders (1991a: 301–318) provides a very useful discussion of Plato's impiety legislation by comparison and contrast with the little we know about the Attic laws covering impiety.

Plato's use of persuasive preambles is connected with the educational function of the lawgiver, who tries to show why certain actions are wrong in order to persuade people not to do them, before laying down the appropriate penalties.[3] This is also more consistent with the general goal of legislation which is to promote virtue in the | citizens by developing their spiritual [127] qualities, rather than physical qualities, as the Spartan system of law tried to do (I, 631a–c).

Therefore, it is in terms of the general purpose of moral persuasion and education that we must understand the first formal proofs for the existence of the gods to be found in the history of Greek philosophy. The absence of such proofs hitherto is nicely reflected in the attitude of Cleinias who thinks (X, 886a) that the existence of the gods is self-evident from observing the sun, the moon, the stars and the beautiful order of the cosmos with its seasons and years. In addition, he cites the fact that all Greeks and barbarians believe in the existence of gods. But this *consensus omnium* was unreflective and could survive only so long as nobody thought to question the existence of the traditional Greek gods. This questioning had already begun with Xenophanes, although his criticism did not lead straight to atheism because Xenophanes himself insisted that there exists a god (or gods).[4]

While Plato was very critical of traditional myths in the *Republic*, in *Laws* X he appears to have shifted the target of his blame. Although he still faults popular myths as one source of corruption, he identifies as the true cause of mischief the novel views of scientists who hold that the visible divinities in the heavens are nothing more than earth and stone (886d3). This is identifiable as one of the views for which Anaxagoras was prosecuted for impiety. According to the Athenian, such a view implies that our beliefs in the gods are merely fables dressed up as arguments to make them plausible for the populace. But he describes this view as a 'wicked ignorance' (886b). It is precisely such new-fangled theories which lead young atheists to scoff at all traditional piety through outrageous acts of impiety.

Having agreed that these are very dangerous views, the Athenian and Cleinias consider their legal options. The first option, says the Athenian, is to make their own defence as if they stand before a court of impious men

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[3] Such goals are explicit in the Athenian's formal prelude to the laws in Books IV–V, which is addressed to an imaginary audience of new colonists for Magnesia. For instance, at V, 718b ff., the Athenian draws an analogy between this 'double method' of lawgiving and the explanatory and persuasive approach of free doctors, by contrast with slave doctors who simply lay down the law for their patients.

[4] See Xenophanes DK B23: 'One god is the highest among gods and men; in neither his form nor his thought is he like unto mortals.'

accusing them of something terrible in assuming the existence of the gods. The second alternative is to return to their primary task as lawgivers and to drop the whole subject of proof, lest the prelude should become longer than the laws themselves. But this would be to revert to the attitude of the traditional lawgiver who simply sets down the laws without explanation. Therefore, the Athenian decides to take up the first option. In this spirit the Athenian offers (888b–c) an admonition to young people who reject the gods but later regret their decision, presumably because of the tribulations of life. He claims that the most important issue in life is to hold the right view of the gods because that influences whether one lives well or not. Here the intimate connection between virtue, *eudaimonia* and belief in the gods, is suggested but is not argued for in detail. Instead what is argued is that there is a connection between atheism and impiety and, by implication, human
[128] unhappiness. Of course there are hardened atheists and other | impious people who hold that human happiness has nothing to do with the gods because, even if they exist, they pay no heed to human affairs and, even if they do, they can be bought off with prayers and sacrifices.

Such people draw sustenance from a 'wondrous argument' which they regard as 'most scientific'. It begins in a typical sophistic manner with a division of all generated things into things that exist either (a) by nature or (b) by chance, or (c) by art. The argument claims that the greatest and most beautiful things are the work of nature and chance, while products of art are inferior because art depends on nature.

Presumably by way of illustration, the Athenian gives a brief summary of the views of an unidentified materialist thinker who holds that fire, water, earth and air all exist by nature and chance, but not by art. It is denied that the cosmos is due to reason (*nous*) or to any god, or any art. It also holds that products of nature are truly valuable, while arts like medicine and agriculture are serious only insofar as they share in nature to some extent. By contrast, politics is less valuable because it has only a small share in nature, while legislation is worthless if it operates on assumptions that are contrary to nature. This view seems to employ the sophistic distinction between *phusis* and *nomos*.

But perhaps the most important part of this passage is the outline given (889e) by the Athenian of the views of materialists about the gods and about justice. They hold that the gods exist by art and not by nature, i.e. that there are specific conventions (νόμοι) which differ from place to place.[5]

[5] This is somewhat reminiscent of the view of Critias (DK B25) that some wise man

Furthermore, the materialists assert that there is one class of things beautiful by nature and another class that is beautiful by convention. Therefore just things do not exist by nature, otherwise human beings would not be constantly disputing about them and altering them. Justice depends on art rather than on nature.

According to the Athenian (890a), these views imply that the height of justice is to succeed by force. This is the source of the impiety that afflicts young people, who behave as if the gods were quite different from what the laws demand by way of belief about them. As a result of such impiety, factions also arise (within individual souls, within families, and within the city) when these false teachers seduce the young people into a life 'according to nature', which involves seeking mastery over others in reality to avoid being a slave to others according to legal convention. This whole passage is very reminiscent of the description in the *Republic* of the divided soul of the tyrant, and of the strife-ridden city over which he rules, so that Plato seems to be suggesting that sophistic impiety breeds tyrannical souls and cities.

II. *The Antidote to Atheism and Impiety* [129]

Now the pressing problem for the lawgiver is to find a cure, or at least an effective form of treatment, that will prevent that epidemic of atheism in the city.[6] Basically, he has two options. Firstly, he can respond with Draconian measures such as threatening death or severe punishment for those who deny that the gods exist or who refuse to accept that justice is the best of all things. This traditional response is always a temptation but Plato does not succumb to it, possibly because it might reinforce the sophistic claim that force constitutes justice.

The second option is to resort to persuasion, what is urged even by Cleinias (890d). Given that atheistic views have been widely broadcast, the Athenian emphasises (891b) the greater need now than ever before to prove the existence of the gods. One crucial implication of such views is that material elements like fire and water, which the materialists identify with nature, are

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invented religion by introducing the notion of the divine and by giving it all the predicates of immortal life. Similarly Democritus (DK B30) says that the wise men of old raised their hands towards the upper air and talked about Zeus being king of all.

[6] The medical language is to be found throughout the *Laws*, not only in the many craft analogies which Plato uses but also in his approach to disorder in the souls of individuals, as well as in the constitutions of cities. On the historical level, we learn from Thucydides (Book II, 53) that the plague in Athens led to an alarming decline in moral standards.

held to be prior to soul. That is the very source of the irrationality and error in such materialist arguments. Here Plato, like many subsequent philosophers, tends to identify logical flaws with moral errors, or at least to regard one as a symptom of the other.

He makes the Athenian draw (891d–e) specific attention to the unusual character of the argument that is to follow, presumably because it highlights both the logical and moral flaws in the materialist doctrines. The soul is the first cause of generation and corruption in all things, and is prior to body in the sense that it governs all the changes and modifications of the body. Such a view of the soul was practically unknown in ancient Athens, since it is a view which Plato adopts from the Pythagoreans and the mystery cults, while giving detailed arguments to support it throughout the *Phaedo* and in the *Timaeus* (34d).

It follows that things which are akin to the soul must be prior to things that belong to the body. For instance, thought, art and law will be prior to hard and soft, heavy and light. Furthermore, works and actions will be primary and belong to art, while the so-called natural things will be secondary and will derive their origin from art and reason. The basic mistake of the materialists can be traced to their misuse of the word 'nature', which they used to refer
[130] to the production of primary things | (*Laws* X, 892c). But if soul is produced prior to fire and air and other natural elements, then it should be ascribed a superlatively 'natural' existence. However, this will be established only if one can show that soul is older (πρεσβυτέρα) than body, and this is what the Athenian undertakes to show in a rather formal manner that involves a departure from the previous dialogical format.

In order to spare his venerable interlocutors any embarrassment arising from their ignorance of such modes of argument, the Athenian proposes (892d) to go through the argument alone like a young man testing the waters of a dangerous river before helping the older men to cross. Once again he invokes (893b) the aid of the god for proving the existence of gods (benign circularity) because even he needs a safe cable to which he can cling in these turbulent waters. It seems to me that these methodological remarks are intended by Plato to draw attention to the fact that it is the rational consistency of the argument itself which is the safest guide to the reality of the divine.

There follow the questions whether all things stand still and nothing moves, or whether all things move and nothing stands still. The answer could be taken straight from a Platonic dialogue (*Soph.* 255, *Tim.* 57): (1) Some things move, others remain at rest. From this 'safe' answer, the Athenian elaborates a detailed set of distinctions between ten kinds of motion, which

clearly belong to the tradition of speculation about the natural world that Plato wishes to revise. The obvious motivation for this excursus into physical speculation is to identify the characteristic motion of soul and to argue for its primacy over the motion of body. For that purpose two types of motion are most important, namely (2a), the motion which always moves another object but which does not move itself; and (2b), the motion which moves both itself and another (*Laws* X, 894b–c). The critical question is which kind of motion is the most powerful, and the answer is the sort of motion which is able to move itself. This leads the Athenian to reverse the order of priority among the enumerated motions, so that the tenth is actually first with respect to genesis and power, while the ninth comes second after it. However, there is a slight inconsistency in this ordering, which is cleared up later, since the first motion enumerated (circular motion around a fixed centre) turns out to be an image of the motion of *Nous*, which itself is prior to soul.

The Athenian gives (894e) two distinct arguments for the primacy of self-motion: it is more logical in character as it depends on the topos of infinite regress. (A1) Given the situation where one thing changes another, and this in turn changes another, and so on, what is the primary cause of change? Plato implicitly assumes (A2) that an infinite series of such things is impossible, presumably because that would not explain the origin of motion. So his answer is (A3) that the primary source of all their motions will be the self-moved thing. For (A4) it is impossible for a thing that is moved only by another to be the first cause of change.

The second argument appears to be slightly more empirical in that it [131]
seems to refer to the observation of things being set in motion: (B1) Suppose the Whole were to unite and stand still, which motion would arise first in it? I think that Plato here implicitly assumes (B2) that the state of rest is natural and needs no explanation. So his answer to the question is (B3) that the first motion to arise within a situation of rest is self-motion. For (B4) self-motion will never be shifted beforehand by another thing, as (B5) no shifting force exists in things prior to self-motion. In summary, the conclusion is that self-motion is the oldest and most potent of all changes because (a) self-motion is the starting-point of all motion; and (b) it is the first to arise in things at rest, as well as the first to exist in things in motion. Second after this comes motion that is altered by another thing, while it itself moves other things.

The next stage is to establish the connection between self-motion and soul. For that purpose the Athenian first appeals (895c) to the ordinary Greek intuition that any physical body which is apparently moving itself is alive. Such an intuition was invoked already by Thales who probably

relied on ordinary commonsense to verify it. But Plato introduces (895d) philosophical distinctions (cf. *Ep*. VII, 342a–d) between the substance of a thing, its definition and its name. This prepares the way for the question of what is the essence of the thing designated by the name 'soul' to which the answer is the definition: 'the motion able to move itself' (*Laws* X, 896a1–2). In other words, self-motion defines the substance whose name is soul. The Athenian concludes (896a–b) that soul is the cause of all change and motion in things. Thus he insists that soul is prior to body, which is secondary and posterior to soul, with soul being the governor and body being the governed. Consequently all the qualities associated with soul are prior to those associated with body, e.g. calculation and true opinion will be prior to bodily length, breadth and depth. Plato has finally given in Book X a metaphysical justification for the ungrounded claims being made since Book I about the priority of spiritual over physical goods (see I, 631b–c; II, 661a–b; III, 688a–b, 697a–c; V, 726a, 727d, 743e).

Since soul is the ultimate cause of all motion, it follows (X, 896d) that it is the cause of good and bad things, as well as of just and unjust actions. Furthermore, it must also control the heavens. Surprisingly, the Athenian supposes (896e) that the heavens may be controlled by either of two souls, the one beneficent and the other maleficent. What makes the critical difference is whether soul works in conjunction with reason or with unreason. When soul cooperates with reason it governs things well, but when it succumbs to unreason it governs badly (897a–b). Hence the important question for cosmology is what kind of soul is in control of the heavens, the earth and the whole circle of the zodiac.

But this question can only be answered (897c) by first deciding on the characteristic motion of reason and then observing whether such a motion governs the universe. On the other hand, however, if the heavens are seen to
[132] move in a mad disorderly | fashion, then we must conclude that it is driven by a bad soul (cf. the disorderly motion in the *Timaeus*, and the passage in the *Statesman*, where the cosmic pilot takes his hands away from the tiller sometimes, so as to let the universe drift aimlessly in a disorderly fashion for a certain period of time).

Now Plato must determine what is the characteristic motion of reason, and this is difficult because it must be a spiritual motion that is not directly observable. This is why the Athenian draws the comparison with the danger of looking directly at the sun and being blinded, so that it is necessary to look at its image in water. Similarly, for the motion of reason, we must look to the different kinds of physical motion and ask which most resembles that of reason.

The answer (898a) is circular motion in one place around the same centre, which the Athenian had previously numbered in first place before giving pride of place to the self-motion of soul. The rationale for this answer is that the motion of reason is also uniform and regular.[7] As Plato puts it in the *Laws* (X, 898b–c), the motion that reflects absolute unreason is one that is never uniform or regular.

Thus we are brought back to the crucial cosmological question: Given that soul is what drives everything, is the universe driven by a good or bad soul? Cleinias thinks (X, 898c) that an appeal to piety is sufficient to settle the question in favour of a good soul, and the Athenian seems to agree; though perhaps we should wonder whether Plato would consider that to be sufficient evidence. Elsewhere in the *Laws*, he refers to the Eudoxean theory of homocentric spheres as evidence that the heavenly bodies move in a regular and orderly manner, despite the appearance of disorderly motion which earned them the name of 'wanderers' (πλανητά, see VII, 821b–822c; XII, 967a–b).

We might have expected the Athenian to introduce such empirical evidence here but instead he goes on to apply the conclusion to the sun, which is not one of the heavenly bodies that wander in the same way as the planets. But it is a perfect example for his purposes because it was almost universally worshipped as a god in the ancient world, and by the Greeks especially under the name of Helios. In fact, it was also closely identified with the god Apollo, whose arrows were likened to the sun's rays. Plato's point is that the body of the sun and its circular motion are seen by everyone, whereas no one sees its soul and we can only guess at its motion and how it exercises control over the body. Indeed the Athenian sketches (X, 898e–899a) three possible ways in which the soul might influence the body, but does not try to decide between them. Whatever way that matter is decided, he thinks that everyone must agree that the soul of the sun is a god unless they have lost their reason.

Given the priority of soul over body, as well as the characteristic self-motion of souls, what Plato claims to have established is that the rational soul moves a visible | body in uniform circular motion. Since this is the typical [133] motion of heavenly bodies like the sun and moon, he claims to have proved that they are moved by rational souls which are gods or living beings dwelling in them. He takes his argument to be confirmed by the reputed claim of Thales that 'all things are full of gods'. But, most importantly for his purposes

[7] See *Tim.* 34a2, 37c, 40a–b, 77b–c, 90c–d; *Pol.* 269c ff.; *Soph.* 249b12.

in Book X, he puts (899c) the burden of proof on those who disbelieve in the gods. Either they must refute the argument about the priority of the soul or accept its consequences and give up their atheism. In conclusion, the Athenian asks Cleinias to agree that the argument for the existence of the gods has been adequately stated (899d).

III. *Morbid Impiety and Its Cure*

The task of the physician of the soul is relatively easy in the case of atheists who are open to rational persuasion, but it is much more difficult in the case of others whose impiety is deformed by their life experience or by vicious habits of mind. Such people tend to accept either the second or third propositions that were set out at the beginning. Like any good doctor, the Athenian tries to give a diagnosis of the causes of such mental pathologies before attempting any prescription for their cure. In the case of those who believe in the existence of gods, he thinks there must be some divine kinship with the gods which leads them to this belief. However, they are driven to impiety by observing both the private and public fortunes of unjust men, who are generally regarded as happy by public opinion. Indeed, public opinion seems to be reinforced by traditional stories and poems that praise evil men, such as tyrants. But what is really convincing for most people is the experience of seeing such people, living a successful life and leaving behind dynasties for their families, despite being guilty of deceit, murder, and other great impieties.

Thus the intelligent observer is faced with a classic problem for theodicy (900a): although he is unwilling to hold the gods responsible for such obvious injustice, yet he cannot find a consistent way of freeing them from blame; so he falls prey to the morbid opinion that the gods exist but do not concern themselves with human affairs. Since this view later found philosophical expression in Epicurus, it may have been a general tendency in Greek thinking. In fact, a similar problem has been already addressed in Plato's *Republic* by means of the inquiry into whether virtue results in human happiness or whether the life of the tyrant may not be the happiest (see Book II, esp. 360e1–362c8).

In order to prevent such impious notions from spreading within the city, the Athenian proposes (X, 900b–c) to attack this pollution by adding another argument. The most important point that has already been established is that the gods are good, and therefore they take care of small as well as of large things. Thus the subsequent argument depends on a detailed analysis

of their goodness, and the drawing of | appropriate consequences from it, [134]
rather than on any empirical evidence of their good works.

Having set out the logical possibilities, the Athenian proposes (901c–d) to challenge the two kinds of impiety together because both accept that the gods exist, though one thinks they can be bribed, while the other claims that they neglect human affairs. Both agree that the gods are all-knowing and all-seeing, as well as all-powerful. Both are also taken to subscribe to the consensus that the gods are exceedingly good. Given this agreed description of the gods, however, the Athenian argues (901e) that it is impossible to accept that they are lazy, since idleness is the child of cowardice among mortals, and laziness in turn springs from idleness. However, assuming (counterfactually) that they do neglect the small things in the universe, there are three possible explanations: (a) either they know that there is no need to care for small things; (b) they do not know, and so are neglectful through ignorance; (c) or they know what is needful but act like akratic men. The latter possibility is definitively rejected by Cleinias (902b), presumably because it is wholly incompatible with the goodness of the gods. Although the second possibility is not explicitly rejected, it would appear reasonable to drop it because it is inconsistent with the assumption that the gods are all-knowing.

This leaves only the first possibility, namely, that the gods neglect human affairs because they know it is unnecessary to care for small things. The Athenian argues (902b–c) against this possibility on the basis of the following assumptions: that human affairs are part of animate nature, that man himself is the most god-fearing creature, and that mortal creatures are possessions of the gods. But the impious view would imply that they are inferior to human craftsmen, who do not neglect the small parts in favour of the whole. For instance, the doctor, who must care for the whole body, is not likely to do so well if he neglects any of the smaller parts. However, since it is not plausible to assume that the gods are inferior to mortal craftsmen, the only alternative is that they do not care for the small things, even though these are easier to control and care for than great things. So the gods turn out to be like someone who shirks labour because he is idle and cowardly. Cleinias agrees (903a) that such assumptions about the gods would be both impious and untrue.

At this point the Athenian claims to have given sufficient arguments. Still, as a sort of charm, he offers (903b) some additional myths to make a persuasive argument that all things are ordered systematically by the god who cares for the universe. For this purpose, rulers of action and passion (i.e. souls) are appointed for even the smallest parts of the whole, so as to reach the goal which is the good of the whole. The crucial point of the myth is that the parts are meant to serve the good of the whole, and not vice versa.

In order to make this perspective more plausible, the Athenian draws an analogy with the crafts such as that of the doctor who looks to the health
[135] of the whole | organism, and treats the parts of the body with that goal in mind. Hence the impiety of those who accuse the gods of neglecting human affairs is due to their ignorance of how what is best for the whole cosmos is also what is best for them, even if they are currently suffering great evil. Such a theodicy will have a long innings in the subsequent history of Western philosophy, most famously in Leibniz's adage that this is the best of all possible worlds.

In support of the claim that the gods exercise providential care for human beings, the Athenian offers (903d–e) a further myth which depends on the implicit assumption that the same soul is conjoined with different bodies at different times. Through the process of transmigration the soul either becomes better or worse, and it is a simple task for the divine 'draughts-player' to move the better soul to a higher place, while demoting the worse to a lower place. This explicit reference to the Heraclitean notion of a cosmic draughts-player also involves the idea that each soul is allotted its appropriate destiny. But the critical question for theodicy is how much responsibility the soul itself bears for its own destiny and how much is due to the all-knowing and all-powerful gods. That this is a very real problem for Plato is evident from this passage where he describes the god, in turn, as the 'supervisor of the All' and as 'the King', which reinforce previous descriptions of the gods as omnipotent and omniscient.

His solution is rather ingenious and, once again, very influential historically. What he suggests is that the providential god has established different and opposite places where good and bad souls tend to congregate, on the principle that like goes with like. In Greek mythology these opposite places were characterised as Heaven and Hades, each being governed by different gods with their own system of rewards and punishments. But, Plato insists, it is not a matter of fate where each soul ends up because it is itself responsible for the sort of body it chooses, as well as for the kind of character it takes on and the type of companions with which it associates in life. Thus we are the authors of our own destiny, since soul is the principle of motion, and it can change the location of its moral abode.

What the Athenian emphasises (904e) is that the whole moral universe is governed by an inflexible decree set down by the divine 'Overseer of the All'. The rule is that, as the soul becomes worse, it joins the company of worse souls and suffers all that such souls do to each other by way of evil. Conversely, as the soul becomes better, it joins with better souls and enjoys the rewards of such company. In effect, the divine lawgiver has set up a system of cosmic

justice in which the penalty seems to follow automatically from the crime, though the criminal is still free to choose whether or not to commit it.[8]

This system is very important for dealing with the obvious counter- [136]
example of the criminal tyrant apparently thriving during his lifetime, which was one of the reasons for the morbid impiety that is being treated here. Despite appearances to the contrary, the Athenian insists (905a–b) that everyone must pay to the gods the due penalty, whether that be on earth or in Hades or in some more fearful region. Anyone who is ignorant of this inflexible decree of the gods can never give an adequate account of life in terms of happiness and misery. Such a solution is quite consistent with Plato's claim in *Republic* IX that the tyrant is the most miserable of human beings, not only because he is at war with himself, but also because of the company he is forced to keep. Furthermore, his punishment, which begins in this life, will continue in Hades with the most dreadful torture imaginable. Plato brings his heaviest rhetorical guns to bear on the impious suggestion that the gods might rule over a universe in which there is any basic disjunction between virtue and happiness.[9]

This also seems to be what lies behind his arguments (*Laws* X, 905d–e) against the third group, who hold the most impious view that the gods can be bribed with prayers and sacrifices. The Athenian considers the essential character of the gods, so as to show that they cannot be seduced by us. Since they are continually in control of the whole heaven, they must be rulers. But the question is whether they are better or worse than human rulers, such as drivers of chariot teams, pilots of ships, leaders of armies, physicians or farmers.

As a preliminary, the Athenian calls on their previous agreement (896c, 904a) that the heaven is full both of things that are good and evil; so that there is an unending battle between good and evil that demands amazing watchfulness on the part of the divine. He insists that, in this battle, the gods and daemons are our allies, since we are their possessions; and that what saves us from evil is justice and temperance, combined with wisdom. By contrast, what destroys us is injustice and insolence, combined with folly.

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[8] In *Laws* V, 728a–b, Plato calls this a system of retribution, as distinct from a system of judicial penalties in the strict sense.

[9] The question of whether there is a necessary relationship between virtue and happiness, which was raised in the *Republic* I, 332d; II, 367e, 369a; IV, 427d, 443a–b; V, 472b; IX, 576c, 588b; X, 612b, continues to engage Plato in the *Laws*. Cf. II, 660e–664b; V, 742d–743c; VII, 816c–d; IX, 858d; 870b–c, 879b–c.

Perhaps to illustrate the point, the Athenian describes (906b) the diseased souls of profiteers who have acquired unjust gain, and whose souls are plainly bestial. They fawn on the gods, using prayers and incantations, so that they can continue to profiteer among men without suffering any severe penalty. What lies behind their strategy is the belief that the gods are lenient with unjust men, provided that one gives them a share of one's ill-gotten gains. It is just as if wolves were to offer bits of their prey to watchdogs, so as to bribe them into allowing the wolves to ravish the flocks under their care.
[137] This unflattering comparison again raises the question of | what kind of rulers or guardians are the gods. The impious seem to liken them to drunken pilots who overturn ships, or to corrupt chariot-drivers who throw a race for gain.

However, both Cleinias and the Athenian agree (907a–b) that such comparisons are intolerable and impious, and that people who view the gods in this way are the most brazenly impious of all. In fact, the gods are the greatest of all guardians who guard the greatest things in the universe. The Athenian explains (907b–c) that he has sought victory in argument over wicked men because of the fear that they would do as they like if they won the argument. Indeed, there is some historical evidence that people like Critias and Alcibiades used sophistic arguments to justify actions which merely reflected their own wicked desires.

IV. *Punishment for Impiety and Its Purposes*

After his elaborate Prelude with all its persuasive arguments, the Athenian thinks (907d–e) it proper to make a statement that serves as an interpreter for the law, warning all the impious to change their ways to piety. Then comes a statement of the law that if anyone commits impiety, either by word or deed, he shall be brought before the appropriate magistrate by anyone who witnesses such impiety. Subsequently, if someone is convicted of impiety he shall be imprisoned, though the type of prison and the length of imprisonment shall vary depending on the kind of impiety involved. Whereas we might be inclined to respect such 'honest atheists', Plato thinks (908d–e) that they deserve punishment for the scandal which they give to others by their frank criticism of the gods. Since they are curable, however, they will be given a relatively light sentence. After this period of imprisonment, those who are reformed will live with others without interference, so long as they are not again convicted of atheism. However, repeat offenders will be judged incurable and sentenced to death.

The harshness of the punishment for incurable atheists shows how seriously Plato regarded the crime of impiety, but he reserves his harshest words and measures for the so-called 'ironic' or dissembling atheists who conceal their real views under a mask of outward piety. Such people are by nature full of craft and guile, and they may become either diviners or religious experts who trade on the credulity of others by promising to bribe the gods with sacrifices, prayers and other incantations. It is precisely these people who are guilty of the worst impiety because they assume that the gods are negligent of human affairs and can be bought off like crooked magistrates. These frauds are described as being like ravening beasts who prey on others, and the punishment meted out to them is appropriately harsh because they | [138] destroy not only individuals and families but also whole cities for the sake of money.[10]

If any of these hypocritical atheists be found guilty, he is to be imprisoned for life in an isolated country gaol where he can have no contact with anyone, except the slaves who feed him fixed rations. When he dies he is to be thrown outside the borders of the city without burial like a traitor, and any citizen who helps to bury him may be prosecuted for impiety. The reason for such harsh punishment seems to be that Plato regarded such dissembling atheism as being like a contagion that threatens the whole city, or as being like the worst sort of treason, because it involves a cynical disregard for all that is sacred. It is revealing that, among the other sorts of impious persons belonging to this class, he lists tyrants, demagogues, generals, and all those who plot by means of sophistic devices to gain power and prestige in the city. What they all appear to have in common is an utter disregard for the law, together with a disrespect for the gods of the city who sanctify the law. This is another symptom of that aggressive individualism which is a product of sophistic theories, and which tends to undermine loyalty to the city.

In his overall conclusions near the end of Book X (909d–e), the Athenian stresses the need for one general law which encourages the majority to offend less against the gods by word and deed. Such a law, which forbids illegal trading in religion, should have the effect also of making them less irrational. The law in question forbids anyone to have a shrine in his own house, and

[10] See *Rep*. II. 364b–365a. It is difficult to know exactly what sort of fraud Plato has in mind, though he might be referring to the travelling prophets and mantics who prospered with the rise of magical practices and purification rituals in the 4th century BC. Presumably Plato would distinguish such frauds from people like Epimenides whom Cleinias (*Laws* I, 642d) refers to as conducting a purification of the whole city of Athens before the Persian invasion.

orders him to go to the public shrines and to hand over his offerings to the designated priests. The Athenian's explicit (*Laws* X, 909e) rationale for the law is that it is no light matter to found a shrine, but one that requires much deliberation if it is to be done properly. It is precisely this centrifugal tendency of private worship that Plato wants to prevent by specifying that all worship of the gods is to be public and common (910a–b), as well as carefully regulated by law.

Another reason given is that it prevents the third type of impious man from acting fraudulently by setting up shrines and altars in private houses. Of course, they are doing so for gain in the hope of propitiating the gods privately by sacrifices and vows, thereby gaining some advantage over other citizens. The Athenian insists that such impiety has dire consequences not only for these people themselves but also for their fellow citizens. It is not very clear what Plato has in mind here, though the most obvious traditional meaning is connected with the notion of pollution, i.e. that the gods may punish a whole household and by extension a whole city for the sins of one individual, as illustrated by the story of Oedipus.

[139] But I think that Plato has something less traditional in mind when he proposes very strict laws against private worship and insists that all public worship be carefully regulated by law. He knows that the private gods of the household and even the gods and heroes of each of the villages represent a perpetual threat to the unity of the city, which can only be fostered by continually strengthening the gods of the city through public festivals.[11]

It is some indication of the seriousness with which Plato treated the crime of impiety that he assigned its cure to the highest magistrates in the city, who are also members of the Nocturnal Council. Their primary task is to protect the foundations of the laws, which are being thoroughly undermined in the worst cases of impiety. They are also charged with the task of reforming those who are curable in the sense that they can be persuaded to abandon their views that the gods do not exist or that they neglect human affairs. Thus, when the Athenian later adverts briefly to a curriculum of education for these magistrates, it is no accident that he refers to disciplines like astronomy and dialectic. Since they represent the head (or *nous*) of the whole city, they will also learn how to imitate the divine order of the heavens in the

[11] At *Laws* V, 738b–d the Athenian says that the lawgiver must not change what has been laid down about cults by the oracles at Delphi, Dodona and Ammon. Every group or tribe (*deme*) is to be given its own daemon or hero so that they can celebrate public festivals, and thereby get to know each other's characters and become friends. The clear purpose is the promotion of social solidarity.

perfectly rational (and circular motion) of their own minds. Thus Book X itself exemplifies part of the theological education of the guardians.

Conclusion

One of my main conclusions, therefore, is that theology is part and parcel of the theoretical activity of the guardians of the law who belong to the Nocturnal Council. Of course, Plato does not here talk about a science called theology that is distinct from the disciplines of dialectic and astronomy that he places on the curriculum of studies of these guardians. However, there is little doubt that such theological topics as the existence of gods and their providence will form an integral part of such studies (XII, 966c ff.). They must also be able to prove that the soul is prior to the body in every important way, if they are to provide the citizens of Magnesia with persuasive grounds for the whole system of values that is embodied in their laws, e.g. that more honour is to be given to spiritual than to physical virtues. Indeed, by their own rational activity they provide a most convincing exemplification both in word and deed of the primacy given to reason (*nous*) as both the source and guiding force for good laws.

The prominence of reason as both a human and divine force that drives all [140]
good legislation is a crucial part of Plato's response to the sophistic theories about the human origin of all laws, which underpin the sharp distinction between *nomos* and *phusis*. In effect, he argues that laws which derive from merely human interests (associated with the body) tend to be confused in their goals; whereas laws that are guided by divine interests (associated with the soul) are consistent in their orientation towards the single goal of virtue. It is this rational consistency of good laws that is the mark of their divine origin, and by obeying such laws human beings can approximate to the divine.[12]

This is the ideal of *homoiôsis theôi* to which the guardians of the law approach most closely, precisely because they understand how the laws are

[12] Just before the formal prelude to the laws of Magnesia in Book IV 713b, the Athenian wonders what would be the right name for the god who rules like a despot over those who possess intellect. One part of the answer (IV, 714a) is that 'law' is the name for a distribution ordered by intelligence (*nous*). Another clue is found in the introduction (IV, 715e) to the Prelude, which cites the Orphic saying that the god holds the beginning, middle, and end. This is subsequently (IV, 716c) interpreted to mean that it is only through prudence and due measure that human beings can become like the god, who is the measure of all things. Plato is clearly proposing (IV, 716d–e) a new ideal of internal rational piety, by contrast with the popular Greek ideal of external observance which is subject to corruption.

grounded in the rational order of the cosmos. Once they have attained this divine perspective on the law, the guardians can find convincing evidence for a clear and consistent connection between virtue and happiness, both in the order of the cosmos and in the daily life of the city. But convincing their fellow-citizens of this unbreakable connection will be perhaps their most important task, given the corrupting effect of any basic disjunction between happiness and virtue. Hence the guardians will be charged with the ongoing task of theodicy in the face of ordinary human experience which shows that the wicked often prosper while the good suffer in this life. This will be one of those Sisyphean tasks for which their virtuous characters and theoretical education will prepare them.

‘POWERS THAT BE’: THE CONCEPT OF POTENCY IN PLATO AND ARISTOTLE [19]

Introduction

The Greek word δύναμις represents a classic example of how a colloquial word was pressed into service as a philosophical term by thinkers like Plato and Aristotle. Thus it might provide a very interesting test case for a philological study of how ordinary Greek was forged into an instrument for philosophical reflection. But here I am more interested in tracing the conceptual role of the term *dunamis* as it was used by Plato and Aristotle for their own philosophical purposes. While it may be useful to determine the exact point at which an ordinary term became technical, it is more important for my task to explore the function of the corresponding concept in resolving real philosophical problems. After some brief remarks on ordinary uses of *dunamis*, therefore, I will focus first on how Plato used it for his own purposes in a quasi-technical way as a criterion for establishing the existence of things. Subsequently, this usage will be compared and contrasted with Aristotle’s fully technical use of the term in conjunction with other correlative terms which he coined for a specific philosophical purpose, given the lack of such terms in ordinary Greek.

A superficial search of the *Thesaurus Linguae Graecae* (TLG) for uses of *dunamis* in Greek prose and poetry shows that the term and its cognates were used as far back as Homer and Hesiod to refer to physical strength and to other kinds of human and divine power. Indeed, it was so common in epic poetry that it forms part of such typical formulaic phrases as εἴ μοι δύναμις γε παρείη, which constitute one of those metrical ‘runs’ that are crucially important for oral poetry.[1] But its use was not confined to epic poetry, as a quick look at Aesop’s *Fables* reveals that *dunamis* was part of common expressions in folk wisdom about trials of strength and about the power of the gods. Significantly, however, there are much fewer listings for *dunamis* under the Presocratic natural philosophers who made the transition from mythical to philosophical thinking about the world.[2] Of course, technical | uses of *dunamis* do appear [20]

[1] Cf. *Iliad* 8.294, 13.786, 22.20; *Od.* 2.62, 10.69, 20.237, 21.202, 23.128. *Theogony* 420.

[2] In the Diels-Kranz index III: 135, very few of the putatively genuine fragments contain uses of *dunamis*, and many of these usages appear to be non-technical; cf. Orpheus B12,

in testimonia by later doxographers, but I suspect that such reports may be infected by Aristotelian terminology. Yet it is noteworthy that the ordinary use of *dunamis* can be traced through the lyric poetry of Theognis, the tragedies of Aeschylus, as well as the comedies of Aristophanes, up to the sophistic prose of Thucydides for whom it has a broad range of meanings, including physical strength and political power. Even in that most philosophical of ancient historians, however, there is little trace of any technical usage for *dunamis*.

Therefore, the word *dunamis* provides us with a good illustration in Greek philosophy of the transition from ordinary talk about powers and capabilities to what we can recognise in Aristotle as a technical philosophical vocabulary. This is the linguistic basis for a conceptual development that can be traced from Plato's dialogues to Aristotle's scientific treatises with special reference to the relationship between powers and being. It is the story of this development that I propose to outline here in a general way as a response to those modern scholars who reject all such talk as circular and uninformative. Zev Bechler (1995), for instance, in his analysis of Aristotle's theory of actuality, complains that the explanations given are uninformative because they merely redescribe the appearances. Subsequently, he deprives Aristotle of all contingent possibilities, leaving him only with genuine potentialities that are immediately actualised; and thereby turns him into a Megarian, despite his explicit rejection of such a view. In this paper, however, I will not be directly confronting Bechler's arguments,[3] and I mention him only as an object lesson of what can happen if one does not take seriously Aristotle's notion of *dunamis*.

I. *From Ordinary to Technical Uses of* Dunamis

As well as being a philosopher, Plato was a great artist who used the Greek language in a masterly and flexible manner. So we cannot expect from him a

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Gorgias B11a, B11, Melissus B7, Philolaus B2 & B11, Empedocles B120, Democritus B3, B234 & B261, Alcmaeon B4, Hippokrates 22C1, 64C2, Pythagoras B15. By contrast, the term is much more frequent in the doxographical fragments, which suggests that the technical terminology may have been introduced by Aristotle and subsequent doxographers. For example. Aristotle's apparent quotation from Democritus at *Met*. XII, 2, 1069b22–23 is clearly infected by later terminology, as the word *energeia* is his own coinage. The same is true for his report on Anaxagoras (1069b19–20).

[3] For a detailed scrutiny of Bechler's arguments, see my review of his book in *Hermathena* 165 (Winter 1998): 109–118.

precise technical terminology, especially where a word had a great variety of meanings in ordinary Greek. For instance, his use of the word *dunamis* ranges widely in meaning from the natural capacity of a magnet (*Ion* 533d3) to an artificial rational power like that of rhetoric (*Gorgias* 456a5). But still we might look for a shift in Plato's use of *dunamis* from the ordinary to the technical usage, while trying to discover the philosophical motivation for such a move. In other words, we might ask: For Plato what does the phenomenon of *dunamis* reveal about being?

In its ordinary usage *dunamis* covers a whole range of natural capacities[4] of both animate and inanimate things, e.g. magnetic power[5] and sense faculties.[6] There is also the more specific linguistic power of naming,[7] the power of speech,[8] and the dialectical capacity for arguing contraries.[9] This is related to rhetorical power,[10] which in the Greek *polis* had a direct bearing on political power.[11] Other more or less unrelated senses of *dunamis* are: the capacity for pleasure,[12] demonic power,[13] the power of appearance,[14] technical capacity,[15] the power of providing goods,[16] virtue as capacity,[17] and military power.[18] [21]

Let us begin with the metaphorical use of *dunamis* in the sense of 'root' or 'power' in geometry, which is thematised both in the *Meno* and the *Theaetetus*. In the *Meno* dialogue it represents something that the slave boy cannot do, i.e. discover the number of the square on the diagonal of the right-angled triangle. At *Theaetetus* 147d, by contrast, *dunamis* names the incommensurable diagonal on which one can (δύνασθαι) construct a square equal in area to others. Subsequently, Plato explains (148a–b) that these are called 'surds' (δυνάμεις) because they are not commensurable with the others in length, but only in the areas of the planes which they have the power to form (ἃ δύνανται). From this explanation one might conjecture that *dunamis*

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[4] *Rep*. 366c1–2 illustrates this wide range of meanings by listing together the *dunameis* of soul (ψυχῆς), of money (χρημάτων), of body (σώματος) and of family (γένους).
[5] *Ion* 533d3–e3.
[6] *Charm*. 168d2, *Prot*. 330a6, *Rep*. 366c2, 508a1, 532a3.
[7] *Crat*. 394b6.
[8] *Theaet*. 185c3–4, *Phdr*. 271c10.
[9] *Soph*. 232e4, *Phil*. 57e7, *Rep*. 454a1, 533a8.
[10] *Gorg*. 456a5, 456e6, 460a2, 467a4, 469d2.
[11] *Pol*. 304d9, *Rep*. 473d3, *Tim*. 25a6, 25b3–5, *Leg*. 712a1.
[12] *Phil*. 32a1, 67a15, *Lach*. 192b6.
[13] *Theag*. 129e1, e8.
[14] *Prot*. 356d4.
[15] *Gorg*. 447c2, *Rep*. 346b1.
[16] *Men*. 78c1.
[17] *Hip. Min*. 375d8–e1, *Rep*. 433d9.
[18] *Menex*. 240d6.

once implied the capacity for construction within mathematical practice before it became a dead metaphor. The original 'Pythagorean' arithmetic of line-segments, planes and solids, which was discredited by the discovery of incommensurability, is partially preserved in Euclid where numerically determinate relationships (e.g. duplicate, triplicate) are established between figures and their 'sides'. Theon of Smyrna (Hiller: 83.24–25) remarks that compounding is responsible for the 'growth' (αὔξησις) from one dimension to the next. Perhaps it was within some such context that the original notion of 'root' (δύναμις) as the side on which a square can 'grow' had its literal meaning. But later this appeared to Aristotle to be a dead metaphor, possibly because he excluded all talk of motion with regard to mathematics.

At *Theaetetus* 153a, however, there is a more interesting reference to the doctrine of Heraclitus that motion (κίνησις) is the cause of what is thought to exist (εἶναι), namely, becoming (γίγνεσθαι), whereas rest is the cause of non-existence or destruction (symbolised by the barley-drink which exists only when stirred). Subsequently (*Theaet*. 156a) Socrates ascribes a secret doctrine of motion to Protagoras/Heraclitus, namely, that all that exists is motion but that there are two kinds of motion, namely, an active power
[22] (δύναμιν … ποιεῖν) and a passive | power (πάσχειν). The combination of these active and passive powers is used to explain different perceptions in terms of fast and slow motions. The object of perception (τὸ αἰσθητόν) is an active power but a slow motion, while the sense faculty is also a slow motion but a passive power. The union and friction of the two motions produces a fast motion, which is the sensation that is neither wholly in the faculty nor in the sense object but somewhere in between. There is an incestuous relationship like that of twins (ὁμόγονον) between different faculties and their proper objects, e.g. sight and colour, hearing and sound.

Theaetetus 182a–b elaborates on this account of the process of perception, e.g. heat or whiteness moves simultaneously (ἅμα) with perception between (μεταξύ) the active and passive elements; so that the passive becomes percipient (αἰσθητικόν) but not perception (αἴσθησιν), while the active becomes, not a quality (ποιότητα) but endowed with a quality (ποιόν τι). Socrates self-consciously remarks on the neologism, ἡ ποιότης, as a general name for quality, and clarifies it with specific examples. The active element becomes neither heat nor whiteness (θερμότης/λευκότης), but rather hot or white (θερμόν/λευκόν). The clarification is repeated: nothing is in itself (αὐτὸ καθ' αὑτό) unvaryingly one, neither the active nor the passive, but from the union of the two, perceptions (τὰς αἰσθήσεις) and the perceived (τὰ αἰσθητά), give birth; so that the perceptible object (τὸ αἰσθητόν) is endowed with some quality (ποιά) which the other perceives (αἰσθανόμενα).

With reference to a similar range of Platonic texts, Stephen Menn (1994) has made the very plausible suggestion that Plato anticipates Aristotle's distinction between *dunamis* and *energeia* by means of a parallel distinction between possession and use in the *Euthydemus* and *Theaetetus*. For instance, at *Euthydemus* 280b5–282a6 Socrates offers protreptic arguments to show that the possession of good things is necessary for *eudaimonia*, though not sufficient for the proper use of these goods. Just as in the case of a craftsman practising his craft, what is necessary and sufficient for human happiness is right use guided by wisdom. This provides us with an interesting parallel to Aristotle's argumentation in the *Protrepticus*.

Another parallel seems to occur at *Theaetetus* 197a8–b1 where Plato proposes to call one type of knowledge a κτήσις ἐπιστήμης rather than a ἕξις because of the ambiguity between possession and use. This weaker sense of knowing is analogous to someone who has some birds in his possession but does not have them in hand, e.g. the sleeping geometer 'knows' geometry in this weaker sense. Menn (82) argues that Plato here anticipates Aristotle by distinguishing between two senses of 'having', and at *Euthydemus* 277e–278a between two kinds of learning, i.e. when one originally grasps the science and when one practises the science that one already has. Thus the weaker sense of 'having' in the *Theaetetus* is an exact parallel for possession, as distinct from use, in the *Euthydemus*. Both distinctions throw light on Aristotle's distinction between use and possession in the *Protrepticus*.

Possibly the most interesting philosophical use of *dunamis* by Plato occurs [23]
at *Sophist* 247 where it is introduced as a general criterion of existence. The context is provided by the so-called 'Gigantomachia', the battle of the giants over the nature of being, as to whether it is purely physical and tangible, or whether it is purely ideal and thinkable. The Eleatic Stranger stages an imaginary dialogue with each party to the dispute, in which they are each asked to defend their view of being. It is anticipated that this will be easy in the case of the defenders of Forms, who are peaceful folk used to dialogue, but difficult for the materialists who violently drag everything down into matter. So the Stranger suggests that they should try to make the materialists better, or at least pretend they are better and more willing to answer according to the rules of dialectic. The axioms used to justify this rather dubious fiction is that the agreement of better men is more valid than agreement by the worse; and that their real purpose is to seek the truth, and not to persuade the worse men.

The first question is whether the materialists will accept that there is a mortal animal, i.e. a body with a soul in it; which implies that soul is something that exists. If they accept this, do they agree that some souls

are just, others unjust; some wise, others foolish? But souls become just by the possession and presence of justice; so that which is capable (τὸ δυνατόν) of becoming present or absent exists. However, if justice, wisdom and virtue exist along with the soul in which they are present, are these visible or tangible? At this point (247b) the materialists reach the following impasse: while they accept that the soul itself has a sort of body, they cannot accept that wisdom and virtue are bodies, though they cannot deny them existence. The Stranger interprets (247c) their hesitation as a sign of improvement in the materialists, since the cruder sort would simply have insisted that whatever they cannot lay their hands on does not exist. But their concession of the existence of any immaterial thing is sufficient to raise the question of what criterion of existence applies to both kinds of thing. Although the materialists are stumped, the Stranger thinks they might accept the following:

> I suggest that everything which possesses any power of any kind, either to produce a change in anything of any nature or to be affected even in the least degree by the slightest cause, though it be only on one occasion, has real existence. For I set up as a definition which defines being, that it is nothing else than power. (247d–e, trans. Fowler)

Theaetetus accepts this suggestion, speaking on behalf of the improved materialists.

Now (248a) it is the turn of the Friends of the Forms (FoFs) to have their position interpreted in terms of an initial distinction between generation and being. They say that we participate in generation by virtue of the body through perception, while we participate in being by virtue of the soul thinking. Real being (ὄντως οὐσία) is always unchanged, and remains the
[24] same; whereas generation | is different at different times. But now (248b) the Stranger suggests that this participation is to be understood either as a passive or an active condition, arising out of some power (ἐκ δυνάμεώς τινος) which is derived from a combination of elements. However, the FoFs do not accept the criterion of existence that was proposed and accepted on behalf of the Giants, i.e. the presence of the power to act or be acted upon in even the slightest degree (248c5–6). The FoFs concede that generation (realm of visible and tangible body) participates in the power of acting or of being acted upon, but deny that either power fits with being (realm of invisible and intangible Forms).

In response, the Stranger asks (248d) whether they agree that the soul knows (γιγνώσκειν), and that being is known (γιγνώσκεσθαι). If so they must specify whether knowing or being known is an active (ποίημα) or passive (πάθος) condition, or both; or that one is active, the other passive; or that

neither is active or passive. Theaetetus points out that, if they are to avoid contradiction, they must espouse the last option but he wonders whether they can really espouse it. The Stranger clarifies (248d–e) the situation: If to know is active (as the verb suggests) then to be known is passive (use of passive voice of verb). But since, by the Theory of Forms, being (οὐσία) is known by intelligence, it is moved insofar as it is acted upon; but that is not the case for something in a state of rest.

The Stranger now considers the possibility that everything is immobile (à la Parmenides): Is it plausible to claim that motion, life, soul and mind are not available to absolute being (τῷ παντελῶς ὄντι μὴ παρεῖναι),[19] i.e. that it neither lives nor thinks, but that, awful and holy, and devoid of mind, it remains fixed and immobile? Theaetetus agrees (249a) that this would be terrible (or strange—δεινόν). So the Stranger argues that if absolute being has mind then it also has life, both of which subsist in a soul.[20] Yet if it has all of these things, it would be absurd for it to be absolutely immovable. Thus one must concede that motion and what is moved are beings (ὄντα). If there is no motion there can be no mind in anyone about anything anywhere. On the other hand, however, if everything is in flux and motion, mind would also be removed from the number of existing things. Why? Without some state of rest, no sameness of quality or nature or relations could ever exist. But without some such stability, there can be no mind. So the philosopher must reject extreme monism or extreme flux, by insisting that the universe consists of things in motion and at rest.

These Platonic discussions constitute the necessary historical background for Aristotle's concept of potency, which is related to the shared problem of not-being and how this is to be conceptualised. The reference to Parmenides in the | *Sophist* shows that this is the problem that Plato has in mind, and [25] he subsequently tries to resolve it by defining motion in terms of otherness, thereby giving it some mode of being. But, as we shall see from the *Physics*, Aristotle is not happy with this solution for many reasons.

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[19] Perhaps it is merely the result of the standard Greek construction for powers being available to something, but there are definite Homeric echoes here which suggest that Plato has divine powers in mind.

[20] This conclusion exerted an enormous influence on the subsequent Neoplatonic tradition of speculation about the divine, e.g. Plotinus and Proclus developed a series of hypostases for Being, Life and Intellect.

II. *The Invention of* Energeia

There is a general consensus among scholars that the *Protrepticus* is one of Aristotle's earliest works, and some people even consider its themes to be mainly Platonic in character. My particular focus, however, will be on his discussion of pleasure in terms of the activity involved in the life of reason, since this is a theme that recurs in his mature works, such as the *Metaphysics* and *Nicomachean Ethics*. Within the context of this discussion in the *Protrepticus*, Aristotle draws an important distinction between two senses of 'living', i.e. with respect to power (κατὰ δύναμιν) and with respect to activity (κατ' ἐνέργειαν, *Protr*. 14 Ross). Significantly, given the obvious connection between life and perception, he illustrates this distinction in terms of 'seeing', which is used both for animals that are capable of seeing yet have their eyes shut, and for animals that are using the power and actively looking at something. Aristotle then extends the distinction to cover both understanding and knowing: in one sense we refer to its exercise (χρῆσθαι) and to thinking (θεωρεῖν); while in another sense we refer to having the power (κεκτῆσθαι τὴν δύναμιν) or to having the knowledge (τὴν ἐπιστήμην ἔχειν).[21]

The clear purpose of Aristotle's illustrations is to establish a parallel distinction between two modes of living, and for this purpose he uses perception as a criterion to discriminate living from non-living things. Thus he argues that 'perceiving' means primarily the use (χρῆσθαι) of the senses, and secondarily the capacity (δύναμις) to use the senses, e.g. in a sleeping animal. The parallel distinction for living things is between those which are awake, and so are really and truly alive, and those which are asleep but are still said to be alive because they can engage in the activity (κίνησις) of being awake and perceiving some object. But this use of the terms 'living' or 'perceiving' is not mere equivocation, as defined in *Categories* I. Instead, as Aristotle explains (*Protr*. 14 Ross), when the same term refers to two realities, and one of them does so because of acting or being acted upon, this will be the primary sense of the term, e.g. 'to see' means primarily an active looking on the part of what can look. What is usually called a *pros hen* equivocal seems
[26] to be the product of two dialectical *topoi* from | Aristotle's *Topics*, namely, the more and the less, and the prior and the posterior.[22] In the *Protrepticus* (14

[21] Stephen Menn (1994: 81) claims that Aristotle may have adopted this distinction from a parallel distinction between possession and use in Plato's *Euthydemus* 280b5–282a6 and *Theaetetus* 197a8–b1.

[22] See Cleary 1988, where I trace the connections between these two *topoi* and the *pros hen* equivocal.

Ross) he insists that something is called 'more' not only when it has a greater degree of something, but also when priority and posteriority are involved, e.g. we say that health is more of a good than healthy things, and similarly for other things which are by nature desirable rather than making something else desirable.

In the same way, Aristotle argues, 'living' refers primarily to someone who is awake rather than asleep, or to one who is engaged in activity with his soul rather than merely having a soul. In fact, he claims, we call the latter 'living' with reference to the former because it is the kind of thing that can act or be acted upon in the former way. Furthermore, he insists that 'using' has the same semantic structure, and he illustrates this in terms of the flute. Someone is using the flute in the proper way when playing it, since this is the best use one can make of it. Thus we should say that a person who is using something properly is using it rightly. But, he argues, thinking and reasoning are the work of the soul either solely or properly; and so one can infer that someone who is thinking correctly is living in the most proper sense. And, according to Aristotle, this is none other than the person who is thinking and contemplating with the most accurate knowledge. Thus, he concludes, 'living' in its complete sense refers to thinkers who are actively engaged in thinking. This betrays the very strong Platonic streak in Aristotle that persists throughout his mature works.

Aristotle's overall purpose here is to prove that the contemplative life is the best life for a human being. He draws on an insight that applies to life, sensation, health and understanding; all of which pertain to living, so it seems that the biological background is important to the *Protrepticus*. The text simply talks about life and its manifestations, not how one passes from one condition to another. On this basis, Blair (1992: 24–25) rejects the conventional view that Aristotle's theory of act and potency was developed primarily to explain change. Judging by the *Protrepticus*, he was mainly concerned with the Parmenidean problem of how one can predicate some attribute like 'living' of something that does not actually have it at the moment. His answer to the question of why a non-A is called an A is in terms of potency, i.e. when it *can* do what A is doing. This fits quite nicely with the problematic of Plato's *Sophist* where *dunamis* is introduced as a mark of being, including intelligible as well as sensible being.

But why did Aristotle coin a new word like *energeia*, when he could (and does) use familiar words like *kinêsis* and *chrêsis* as correlative terms for *dunamis*? Blair (27) argues that the reason was that thinking is not obviously a kind of process, i.e. there is no evident change going on while one is thinking, though a change might be involved in getting into that state. So, even though

kinêsis clarifies *energeia* by underlining its active nature, it cannot be used
[27] as a substitute | for it. Blair claims that Aristotle coined the noun *energeia* from a rare active voice (ἐργεῖν) of the middle deponent verb, ἐργάζεσθαι, together with the prefix ἐν, so as to underline the internal activity. But, since the middle voice of the verb also had an active sense of 'to work' or 'to act', it is likely that Aristotle fixed on the unusual active voice in order to emphasise the activity itself rather than any product or object. On the basis of this etymology, Blair (18–19) argues that Aristotle wanted to avoid having the word *energeia* interpreted as 'actuality' or as a static modality. Therefore, he suggests that it should always be translated as 'internal activity' rather than 'actuality' or even 'act', though the medieval schoolmen were closer to Aristotle's real meaning than modern scholars because they meant by 'act' the immanent activity that is characteristic of living beings. Blair has here suggested a plausible etymology for *energeia*, which can be checked against Aristotle's own self-conscious attempts to define and clarify the concept.

In *Met*. IX, 3, for instance, Aristotle sets out to defend the reality of *dunamis* against the Megarians who claim that a thing is capable only when it is in activity and, conversely, when it is not acting it is not capable of acting. Impressive though this view may be as an exercise in Parmenidean logic, Aristotle points out that it flies in the face of commonsense facts about the world, such as that a craftsman can make something even if he is not actually making it, or that a coloured object can be perceived even if it is not actually being perceived. The logical result of the Megarian position would be the elimination of change (κίνησις) and generation because it implies that what is not (actually) happening is incapable of happening. In order to preserve the validity of our commonsense experience, therefore, Aristotle insists on the difference between *dunamis* and *energeia* against those who seek to identify them, while remarking ironically that this is no small thing that they seek to destroy (*Met*. 1047a20).

Within this context, Aristotle offers a very general definition of potency as what something has if there is nothing impossible in its attaining the activity of which it is said to have the power (1047a24). For instance, if a thing is capable of sitting then there will be nothing impossible in it engaging in the activity of sitting, even if it is not now actually sitting. On the face of it, this definition appears to be circular or at least unhelpful because it requires another undefined term, namely activity, for it to be intelligible. Perhaps Aristotle was aware of the difficulty because he goes on immediately to offer some philological remarks on the word '*energeia*', i.e. that its most important sense is connected with change (κίνησις) and that from this primary sense it has been extended to other things. He also makes the peculiar remark that

energeia is tending towards (or merging in the direction of) *entelecheia*, but I will postpone my comments on this until I discuss the etymology of that second correlative term for *dunamis*.

III. *The Invention of* Entelecheia [28]

In support of his claim about the primary sense of *energeia*, Aristotle explains that this is the reason why some people (Plato?) do not attribute movement (κινεῖσθαι) to things that do not exist, even though other attributes may be assigned to them. For instance, objects of thought and particularly objects of desire may be things that do not exist, but nobody would be so foolhardy as to claim that things moved (κινούμενα) do not exist (unless of course one is a Parmenidean). The explanation which Aristotle gives for this difference requires some unpacking, as it involves both of the correlative terms for *dunamis*, namely *energeia* and *entelecheia*. The reason, he says, is that some things which are not (yet) in *energeia* will be in *energeia*; and among non-beings some things are in potency (δυνάμει) but are not (yet) beings because they are not in *entelecheia*. It is still not clear what this means in plain English, and there is only so long one can postpone the risk of translation. But what is quite clear is that for Aristotle the problem of being and non-being can only be resolved satisfactorily by means of the distinction between *dunamis* and *energeia*.[23] Once again, this fits neatly with the problem-situation in Plato's *Sophist* where *dunamis* was used as a characteristic mark of being.

Even more so than in the case of *energeia*, however, there is no clear scholarly consensus about the etymology of *entelecheia*, and Daniel Graham (1987: 184n5) even charges Aristotle himself with a mistaken derivation, as it is clear to Graham that it must be derived from ἐντελῶς ἔχειν. Since Aristotle himself gives no clear definition or account of the meaning of *entelecheia*, we must try to determine it from usage and context. Following a hint from Aristotle (*Met.* 1050a21–23), LSJ claims that ἐντελέχεια is derived from ἐν τέλει ἔχειν, and means 'to be complete or absolute', by analogy with νουνέχεια from νουνεχής. But George Blair (1992: 79) claims that a better analogy would be with Aristotle's other neologism, *energeia*, so that the ἐν- emphasises 'having the end within' rather than completeness, i.e. *telos* is the object of

[23] Although I cannot discuss the issue here, one should note that many scholars such as Calvert (1976) and Rosen (1979) have cast doubt on whether Aristotle has even adequately understood, never mind refuted, the Megarian argument. However, I do think that Bechler (1995) goes too far in claiming that Aristotle's own view can be reduced to that of the Megarians. For me this is another reflection of the hubris of modern scholars.

echein, rather than of the preposition. Thus he argues that ἐντελέχεια means literally 'internal-end-having' or 'having the end within', as opposed to having it outside. If Aristotle had meant 'complete' or 'being at an end', Blair objects, then he could have used a noun derived from τέλειος or any of the other cognate terms which were available in ordinary Greek. Why should he go to the trouble of coining a new word unless he wanted to convey something very precise that could not be captured by ordinary language?

[29] One might agree that Aristotle must have had a reason for coining not one but two correlatives for *dunamis*, without accepting Blair's rather elaborate conjecture about the origin and meaning of this new terminology. Briefly stated, his conjecture is that Aristotle first coined the word to refer to the immanent activity that characterises living things, so as to explain how we can sometimes refer to something as a living thing, even though it is not engaged in that activity but is only capable of engaging in it. In other words, the basic insight was into capacity but, since there was already a word in Greek to capture this, Aristotle only needed to coin a precise term to cover the correlative activity. But *dunamis* has two senses: the ability to do something and the ability to be something, e.g. a lump of bronze is potentially a statue if it can be shaped into a statue. It is only within the context of change, however, that it makes sense to attribute to an inanimate being a characteristic which it does not have at the moment. For instance, it is not obvious that what makes a statue a statue is some internal activity; so Blair thinks that Aristotle was forced to invent a new term as a correlative to this different sense of *dunamis*. He conjectures (31) that ἐντελέχεια was intended to take care of this second correlative, and presumably to account for how one thing could change into another.

This is an attractively clear and testable hypothesis because it implies that Aristotle should use the term ἐνέργεια in contexts where he is discussing the active sense of *dunamis* associated particularly with living things, while using the term ἐντελέχεια where the topic is the passive sense of *dunamis* that is linked with change. But, as Blair knows from his elaborate word searches, there is no such simple or straightforward pattern to Aristotle's usage. For instance, the two terms seem to be used interchangeably, if not synonymously, within the context of Aristotle's extended attempt to define and clarify the concept of change in *Phys*. III, 1–3. In order to account for such complications, Blair is forced to offer a more complex hypothesis which is psychologically less plausible, though it may still be tested against the available philological evidence, as Blair tries to do with admirable scholarly integrity. He claims that at some point, perhaps in his investigation of change, Aristotle began to see that he really didn't need a new term in addition to ἐνέργεια, because

what made a stone a stone is what the elements were doing internally, just as what makes a body a thinker is what the body is doing internally. But Aristotle did not repudiate the term ἐντελέχεια entirely: instead he treated it as superfluous and used it occasionally in relation to ἐνέργεια.

In one way this is a very plausible hypothesis because it has been designed by Blair to cover the philological evidence that both terms are sometimes used indiscriminately within the same context, even though in most texts Aristotle's use of ἐνέργεια is much more frequent than that of ἐντελέχεια. In another way, however, the hypothesis becomes implausible the more one examines its implications. As Blair (52) himself points out, if this hypothesis is true, Aristotle would have to rewrite any previously written treatise on act and potency because, as a metaphysical | treatise, it would have been written [30] in terms of ἐντελέχεια not ἐνέργεια, which originally had biological rather than metaphysical significance. Thus Blair is led by his theory to predict that in all probability there was a discussion of act and potency in terms of ἐντελέχεια, which Aristotle rewrote in the form that we now have. It is difficult to know how we are supposed to test this 'prediction', but it seems to conflict with Aristotle's discussion of the different senses of *dunamis* in *Met*. V, 12, which never mentions either of these correlative neologisms. It is true, however, that ἐντελέχεια is mentioned once in V, 7 (1017a35–b9) with reference to the many senses of being, but that renders its absence from V, 12 all the more striking.

In his careful study of the origin of these terms, Menn (1994) claims that *entelecheia* always means 'actuality', whereas *energeia* originally meant activity but was later extended to mean actuality. Since Aristotle was aware of this analogical extension of *energeia*, Menn (105) argues that he avoids such usage in his physical treatises and also in the first seven books of the *Metaphysics*. But in *Met*. IX & XII, by contrast, he avoids the term *entelecheia* and uses *energeia* for actuality. The reason for this peculiar strategy, according to Menn, is that Aristotle wanted to show that *energeia* is prior in many ways to *dunamis*, so as to prove in *Met*. XII that the unmoved mover as first principle is pure *energeia* without *dunamis*. I find this to be a much more plausible explanation of Aristotle's usage, precisely because it provides a philosophical motivation for the introduction and development of new terminology.

By contrast with Blair's developmental approach, therefore, I propose to consider Aristotle's terminology in the light of his account of appropriate dialectical methods in *Topics* I.[24] For instance, he claims that dialectic has

[24] I am grateful to Stéphanie Grégoire for allowing me read some of her very interesting

at least four tools at its disposal for the task of providing principles for the particular sciences. Firstly, there is its ability to provide premises for syllogisms; secondly, it can distinguish the many ways in which each thing is said; thirdly, it is capable of discovering differences; and lastly, it is able to consider similarities between things either inside or outside the same genera. These are the 'powers' of dialectic which we can understand best by observing their activities when Aristotle applies such tools in his own scientific inquiries. For example, the first tool can be seen in action wherever he collects and then sifts the opinions of other philosophers in search of a reliable starting-point (cf. *Phys*. I; *Met*. I, III & IV). The second tool is active on the many occasions when Aristotle carefully distinguishes the many ways in which things are said, so as to avoid the standard sophistic fallacies, but also to find principles that are peculiar to the genus of the science in question. The third tool involves the exercise of our ability to discover differences, especially between things of the same kind, given that differences between
[31] genera are more obvious. Conversely, the fourth tool involves the | exercise of our ability to examine similarities, especially between things from remote genera that have a proportional likeness, given that it is rather easy to see the likeness between things of the same kind. It is the last two tools, as discussed in *Topics* I, 16 & 17, which are particularly useful for discovering and clarifying definitions that will become the principles of the special sciences. But it is the application of all four tools that confirms and illustrates Aristotle's claim that dialectic is useful for the foundations of the sciences. It also enables us to understand his peculiar procedure in many books of the *Metaphysics*.

Consistent with his account of the second tool of dialectic, *Met*. V, 7 outlines the major senses of 'being' which are also used elsewhere (*Met*. VI) in the *Metaphysics*, i.e. being *per se* as distinct from *per accidens*, being in the sense of the categories, being in the sense of truth as distinct from falsity, and being in potency (τὸ δυνάμει) as distinct from being in actuality (τὸ ἐντελεχείᾳ). Despite what Blair says about 'actuality' being misleading as a translation of ἐντελέχεια, it is precisely here where Aristotle uses an adverbial dative that one feels called upon to use a static rather than an active term. But let us consider Blair's translation of the relevant passage from V, 7, 1017a35–b9:

> Again, 'to be' and 'being' signify that some of the things that were mentioned are spoken of potentially, and some as having their ends within them. That is, we say that a thing is a 'seeing' thing both when it is potentially seeing, and when it has its end within it; and in the same way, a 'knowing' thing applies

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unpublished research on this topic and for making these points much clearer to me in personal discussion.

> to the one who can use knowledge and to the one using it—and a 'resting' thing refers to what at the moment has the characteristic of being at rest and to what is capable of resting. And the same thing applies to realities: we say that the Hermes 'is' in the stone, that there 'is' a half of a line, and that what is not yet ripe 'is' grain. But when a thing is potential, and when it is not, will be explained in other places.

The concluding line seems to refer forward to V, 12, and perhaps also to other discussions of potency, so we can postpone consideration of that concept to the next section. Let us now confine our attention to what this passage tells us about *entelecheia* as a correlative term.

As Blair (86) notes, two of the major examples used here to illustrate *entelecheia* ('seeing' and 'knowing') were also used in the *Protrepticus* to illustrate *energeia*, and will be repeated with reference to that concept in *Met*. IX. This is very significant for our understanding of both concepts because Aristotle never gives anything more formal than an ostensive definition for either of them. Blair also finds significance in the fact that Aristotle here adverts to 'using' the faculty of knowing to explain *entelecheia*, just as he did in the *Protrepticus* to explain *energeia*. So let us assume as established a clear parallel between the two passages, and ask whether that establishes that the two concepts are interchangeable for Aristotle and serve identical conceptual functions. If that | were the case, however, it seems superfluous [32]
for him to have coined two different terms that have distinct etymological origins.

With reference to this difficulty about *entelecheia*, Blair (81) conjectures that Aristotle sought a word that did not connote activity like *energeia*, but rather the embodiment of a Platonic type of form; thereby removing Form from the never-never-land of subsistent aspects and connecting it with the ability of something to be this or that. Thus Blair concludes from his etymological analysis of the word that it means 'having its end within it' because Aristotle was looking for a correlate to *dunamis* which refers to having the end within, as a necessary corrective to Platonic separation. Blair argues that, since the original occasion for the definition of *energeia* has nothing to do with process or change, Aristotle would not have connected this insight specifically with change and its completion. So Blair (82) finds it more reasonable to assume that what Aristotle realised was that *entelecheia* as the other correlate of *dunamis* would get rid of the subsistence of Platonic Forms (which Blair calls Aspects). On the face of it, this seems quite plausible because Aristotle's objections to separated Forms tend to emphasise Plato's inability to explain change in the sensible world. But, on the other hand, Aristotle also insists that the primary meaning of *energeia* is connected

with change. Thus, as Blair himself realises, his plausible conjecture about two different original contexts for the coining of these neologisms does not adequately explain the pattern of subsequent usage. So he is forced to tell another story about Aristotle coming to see that both terms mean the same thing, with the result that *entelecheia* is gradually dropped from his active philosophical vocabulary.

IV. Dunamis *as a Philosophical Concept*

Aristotle had the instincts of a scientist (rather than of an artist) who wanted to become more precise about the internal relationship between the different meanings of words because he considered language to be an accurate guide to the way things are. Just as with Plato, however, there is also a wide range of non-technical meanings of *dunamis* in Aristotle, e.g. the capacity for sight (*Protrept*. 75.1–3, 84.2; *Prob*. 965b16; *De Sensu* 437a7); political power (*Pol*. 1254a14, 1282b16); the power of heat (*Prob*. 862a30; *De Spir*. 481b13); the power of rhetoric (*Rhet*. 1355b25); the power of tragedy (*Poet*. 1450b18); the power of speech (*De Juv*. 469a3); the power of sophistic appearances (*Soph. El*. 165a30–35). Aristotle's characteristic method is first to collect the various senses of a word (like gathering the phenomena in empirical inquiry) in order to establish some systematic relationship between them, such as priority and posteriority, or analogy, or synonymy or homonymy (pure ambiguity and *pros hen* equivocity).

Aristotle's survey of the different meanings of *dunamis* in *Met*. V, 12, does
[33] not mention *energeia* or *entelecheia* as correlates, presumably because | his own technical neologisms would hardly qualify as current usage. Under the first usage listed, potency (*dunamis*) means the principle of motion or of change, which is in a thing other than the thing moved or changed, or in the thing moved but qua other. For instance, the art of building is a potency which does not exist in the thing built (i.e. the matter) but in the builder, while the medical art might be in the man being healed, not qua patient but rather qua doctor. For convenience, let us call this 'power' as marking the active sense of potency. Correspondingly, 'the powerful' (τὸ δυνατόν) is that which has such a power of moving or of changing another or itself qua other—for even that which brings about a stop is powerful in this sense of active potency.

In its second usage, potency also means the principle of being moved or of being changed by another thing or by the thing itself qua other. For in virtue of the principle by which a thing is acted upon in some way, we say that the

thing is capable of being acted upon (δυνατὸν … εἶναι παθεῖν). Let us designate the second sense by means of the term 'capacity'. In comparison with the first usage, this passive sense of potency tends to be given primacy within the context of physical change. Correlatively, some thing is called 'the capable' (τὸ δυνατόν) if it has a potency of being changed by another thing, or if it has a potency of changing in a certain way, either for the worse or for the better. Aristotle explains that even that which is destroyed is thought to be capable of being destroyed, since it would not have been destroyed if it were not capable of it. As it is, it has some disposition (διάθεσις) as a cause or principle of being so affected. Sometimes it is thought to be such by having something (τῷ ἔχειν τι), but sometimes by being deprived of something (τῷ ἐστερῆσθαι). And if a privation is in some sense a having, everything will be capable by having something; so it will be capable by having either a possession (ἕξις) as a principle, or the privation of this if it can have it. But if a privation is in no way a possession, then 'capable' is equivocal (ὁμωνύμως).

According to a third distinct usage, potency means the principle in virtue of which one accomplishes something well (καλῶς) or according to choice (κατὰ προαίρεσιν). Aristotle explains that sometimes we say of those who merely walk or speak, but not well or not as they choose, that they are incapable of speaking or of walking. Let us call this 'acquired potency' since it is important for understanding rational powers. However, this potency exists also in inanimate things, such as instruments; for it is said that one lyre is capable of being played, but another not, if the latter's tone is not good.

By contrast, those habits are also called 'potencies' in virtue of which things cannot at all be affected or changed, or cannot easily be changed for the worse. For example, things are broken or crushed or bent or altogether destroyed, not by being capable but by not being capable or by lacking something (ἐλλείπειν τινός). Thus they are unaffected (ἀπαθῆ) in this way, if they are so affected only with great difficulty or only slightly because they have a potency or are able or are somehow disposed. This strange negative meaning of *dunamis* almost | amounts to being incapable rather than being [34]
capable in the ordinary sense. In English we might talk about a capacity for resistance. By way of illustration, Aristotle could perhaps have cited solidity as a perceptible quality of earth, which passively resists change of shape.

Along with the various meanings of potency, Aristotle lists corresponding meanings of 'incapacity' (ἀδυναμία), which is the correlative opposite of 'potency'. This involves his dialectical technique of description by the use of antonyms. First there is the privation (στέρησις) of a potency or of such a principle as previously described either (a) in the sense that there is no such potency at all in the thing or (b) that the thing does not have the potency

which it should have by nature or (c) even in the sense that it does not have it at the time when it should by nature have it. Aristotle explains that we should not use the expression 'incapable of begetting' in the same way for (1) a child, (2) a man, and (3) a eunuch. This explanation seems to refer to different levels of potency already hinted at in V, 7. In general, he holds that for each kind of capacity, there is an opposite incapacity, e.g. for that which can simply move and for that which can move well.

But there is also the incapable in the sense of 'impossible' as the opposite of 'necessary' (ἐξ ἀνάγκης), e.g. it is impossible for the diagonal of a square to be commensurate with the side. In other words, it is necessarily false to claim that the diagonal is commensurate with the side; while its contrary is necessarily true. The contradictory of the impossible is the possible, and this is the case when it is not necessary that the contrary of the possible be false, e.g. if 'a man sits' is possible, then 'a man does not sit' is not false of necessity. Thus there are three senses of 'possible': (a) that which is not of necessity false, (b) that which is true, and (c) that which may be true (*De Int.* 12–13).

Finally, it is only in a metaphorical sense (1019b33: κατὰ μεταφορὰν λέγεται) that the term 'potency' or 'power' is used in geometry. It is noteworthy here that whatever literal meaning the notion of power in mathematics held for Plato is lost to Aristotle, so that he treats it as a sheer metaphor. From his exhaustive survey, however, Aristotle concludes (1020a1) that there is a *pros hen* structure to the different meanings of 'potency'. Except for the sense of 'possible', which is not said according to potency, all of the senses of potency are related to the first potency, i.e. the principle of change in another thing or in the same thing qua other. Aristotle explains that the others are called 'capable' in view of the fact that something else has a power, or does not have a power, or has a power in a certain manner (ὡδί). Similarly, for 'incapable'.

He concludes, therefore, that the main definition of the primary potency would be a principle of change in another thing, or in the same thing qua other. Even though Aristotle subsequently develops and extends the notion of *dunamis* to make it more compatible with his theory of substance, he always insists that its primary meaning is related to change. However, I think that the primacy involved here is what is more familiar to us rather than what is more familiar by nature.

[35]

V. *Changing Powers*

The appearance of *dunamis* that is most familiar to us is the phenomenon of physical change or motion in the sensible world. Thus the concepts of

dunamis and *entelecheia* (more so than *energeia*) are central to Aristotle's definition of change, and hence they are crucial for his understanding of the processes of nature. This definition represents his solution to the Platonic problem about not-being, which was inherited from Parmenides and discussed extensively in the *Sophist*. Plato had given change a foothold in being by analysing it in terms of otherness, but Aristotle sets out to give a more adequate definition. Such a historical context becomes obvious in *Phys*. III, 2 when Aristotle tries to justify the adequacy of his definition over previous attempts to define motion and change.

As usual, Aristotle's preliminary questions are very important, since they determine the direction of his whole inquiry. Concerning the mode of being of change he sets out the following alternatives: it is only in actuality, or it is both in potentiality and actuality. In the parallel passage in *Met*. XI, 9, he gives a third alternative, namely, that it is potential only, though this option is more relevant to the infinite. Subsequently in *Phys*. III, 1, Aristotle asks to which category change belongs: whether to substance, or quality, or quantity, or place. He also seems to suggest that it might belong to the category of relation, since moving and being moved are correlative because the mover is always of something moved, and the moved thing is always moved by a mover. What he clearly rules out, however, is the possibility that change might exist apart from any of these things, given that change is always either in substance or in quantity or in quality or in place. In other words, he is making the anti-Platonic point that there is nothing common that is above these, and that is neither a 'this' nor a quantity, nor a quality, nor a place. However, each type of change can belong to things in a double way, e.g. a substance has its substantial form and its privation, while quantity may have completeness (τέλειον) or incompleteness (ἀτελές). Therefore, Aristotle concludes (rather misleadingly), there are just as many types of motion and change as there are types of being. In fact, he reduces them to four main types of change, though it is significant that he should draw a parallel between the conceptual structure of change and that of being, just as he did in *Met*. V.

By way of preparation for his first attempt at defining change, Aristotle draws a distinction within each genus between what is in actuality (ἐντελεχείᾳ) and what is in potency (δυνάμει). Consequently he defines change as: the actuality of a potential being qua potential (201a10–11: ἡ τοῦ δυνάμει ὄντος ἐντελέχεια ᾗ τοιοῦτον κίνησίς ἐστιν). Aristotle now applies this general definition to particular kinds of change, e.g. alteration in quality is of the alterable qua alterable. As an illustration of the general definition of change, he uses the technical | example of house-building. When the buildable as [36]
such is in actuality, then it is being built and that is house-building. Similarly

in the case of other processes like learning grammar or being healed of some disease. Although some things may be the same both in potentiality and actuality, this does not happen at the same time nor in the same respect. We shall later recall this as an important distinguishing mark between changes and activities such as seeing or the exercise of acquired knowledge.

These conceptual differentiations enable Aristotle to offer a second more elaborate definition of change as follows: the actuality of a potential being, when it is actually in activity, not qua itself but qua changeable, is a change (201a27–29: ἡ δὲ τοῦ δυνάμει ὄντος ⟨ἐντελέχεια⟩, ὅταν ἐντελεχείᾳ ὂν ἐνεργῇ οὐχ ᾗ αὐτὸ ἀλλ' ᾗ κινητόν, κίνησίς ἐστιν). By way of clarification for this rather confusing set of distinctions, Aristotle offers the following illustration. The bronze is potentially a statue, but still it is not the actuality of the bronze qua bronze which is a change; for it is not the same thing to be bronze and to be potentially something (else), otherwise the actuality of bronze qua bronze would be change. This is even clearer in the case of direct opposites like the capacity for getting well and for getting sick, since Aristotle regards these as quite different capacities, though they may belong to one and the same subject. Therefore, from these considerations it is clear that change is the actuality of the potential qua potential (201b4–5: ἡ τοῦ δυνατοῦ ᾗ δυνατόν ἐντελέχεια φανερὸν ὅτι κίνησίς ἐστιν). As evidence for the correctness of his definition of change, Aristotle returns to his favourite example of house-building: when the buildable qua buildable is in activity (ἐνέργεια), then there is house-building—not before, when nothing is happening, nor after, when the potency for building is exhausted.

One common interpretation of Aristotle's definition of change is that it is the process by which the potentiality of bricks and stones for being built into a house is actualised. For instance, Ross (1936: 537) thinks that *entelecheia* must mean 'actualisation' rather than 'actuality', because it is the passage from potentiality to actuality that is change. But, as Aryeh Kosman (1969: 41) rightly objects, this interpretation would make the definition circular (the '*virtus dormitiva*' trap[25]) since it would be defining change in terms of the very concept in question, i.e. the process of actualisation. Against Ross's interpretation stands the fact that Aristotle uses *entelecheia* rather than *energeia*, which he could have used if he wanted to highlight the process

[25] See the Third Intermission of Molière's comedy, *Le malade imaginaire*: 'Primus Doctor: Demandabo causam et rationem quare opium facit dormire; Bachelierus: A quoi respondeo quia est in eo virtus dormitiva cuius est natura sensus assoupire.' Contrary to what Molière's jibe implies, however, medieval commentators on Aristotle were well aware of the danger of circularity in this distinction; cf. Aquinas, *In Phys*. III, lect. 2.

rather than a completed state. But the most crucial question is how we are to understand the qualifying phrase 'as such' in the definition of change as the actuality of a potential being as such. If we are to avoid circularity, this cannot be understood as the actuality of the potentiality for | being in motion, [37] e.g. the process by which bricks and stones begin to be built into a house. For one thing Aristotle always insisted that the beginning of motion cannot itself be a motion, since there is no period of time in which motion begins. Furthermore, he thinks of change as the potentiality to *be* something rather than to *become* something.[26] For example, it is the bronze qua potentially a statue that is change rather than the bronze qua potentially being made into a statue. But then the problem becomes one of identifying some actuality that is not identical with the result of the change, which latter only comes into existence when the change is finished.

Here I must anticipate the development of my topic somewhat by taking a leaf out of Aristotle's *De Anima* II, 5, where he distinguishes between different levels of potentiality with reference to perception and human cognition in general. Perhaps the distinctions might be better illustrated in terms of the familiar experience of acquiring a language, whether this be a native or foreign language. Every human being is born with a capacity for language (let us call this potentiality$_1$), but it requires a certain process of habituation for anyone to become a native speaker of the language in question (let us call this potentiality$_2$) so that s/he can speak it at will. This is no longer a basic capacity but is rather a kind of actuality that we could call a disposition (ἕξις), if we wanted to use Aristotelian terms.[27] With some caveats, we might draw an analogy between this kind of actuality and change. Just like the native speaker, so also with the bricks and stones; it is only when they are being built that they fully manifest their potentiality to be a house qua potentiality. Before the building started, they were in a state of basic potency like that of the child who has not yet learned any language. After the bricks and stones are built into a house, they lose their first-level potentiality for being built but, as the analogy with language suggests, they may retain a second-level

[26] Robert Heinaman (1994) has argued against Kosman's interpretation in terms of potentiality for being that Aristotle's definition specifies a potentiality for change and, therefore, is circular.

[27] In *Met*. V, 20 Aristotle gives us good grounds for using this term when he explains one meaning of 'having' (ἕξις) as follows: 'a kind of activity of the haver and the had—something like an action or movement. When one thing makes and the other one is made, between them there is a making; so too between him who has a garment and the garment which he has there is a having.' (trans. Ross/Barnes)

potentiality. Thus, in order to understand the constitutive actuality that is change, we must be clear about the sort of potentiality that is indexed by the qua-phrase in the definition, whether that reads 'qua such' or 'qua potentiality' or 'qua buildable'. It is not basic (or deprivative) potentiality but rather a potentiality that is manifesting itself in a constitutive actuality. Thus, to use Aristotle's example, it is when the buildable is being built that it is most fully manifesting itself as actually buildable; so that the constitutive actuality of being buildable is nothing other than the process of building. When the house has been built, however, the potentiality of bricks and stone for being buildable has been exhausted and so the change ceases.

[38] Kosman suggests that change is the activity expressed by a subject at the first level with respect to its goal—the activity of an object that is potentially other than it actually is. But in that case Aristotle's definition would not apply to the subject at rest, which is not exercising its potentiality to be other than it is. Just like the second-level knower in *De An*. II, 5, who exercises his knowledge only when theorising, the deprived subject of *Phys*. III, 1 exercises its potentiality only while it is moving. However, change is not only dynamic but also directed to a goal that the subject lacks, and this can be manifested by expressing its lack. This is the gist of M.L. Gill's (1989: 194) objection to Kosman's analysis. Since the subject that undergoes the change lacks, as such, the positive character that guides the removal of lack, the subject cannot account for the directedness of its change. Thus the direction of change must be provided by an agent that leads the patient to the positive goal; and so the change presupposes a mover. Thus Gill claims that Aristotle's treatment of change in *Phys*. III, 1 is a partial account that finds its completion in III, 3, which shows that change is the mutual actuality of an agent and a patient, located in the patient. So change exists only while the agent imposes the goal on the patient, which responds by developing towards it. Thus, with the help of his theory of agency, Aristotle tries to show in *Phys*. III, 3 that the change which takes place in the patient is a connected progression towards a goal. This leads to a revision of the original definition of change given in *Phys*. III, 1.

In *Phys*. III, 3 Aristotle argues that the change which the patient undergoes is the actuality of both agent and patient. Although change occurs in the patient and not in the agent, there is a single actuality of both. While there is only one road from Thebes to Athens, for instance, it has different properties depending on how it is described. Similarly, teaching and learning involve the actuality of one change in the learner. Depending on its description, the change has different properties, e.g. the actuality of the agent as subject that occurs in the patient, or the actuality of the patient as subject caused

by the agent. Thus the change can be viewed as an active production or a passive response, although there is only one actuality. The agent's producing is a change of the agent as well as the patient, but it has nothing to do with the self-motion or physical reaction of the agent. For instance, the teaching, which is the actuality of the teacher, takes place in the one who learns, and has nothing to do with the self-motion of the teacher. However, such an action qualifies as a change of the agent because it satisfies criteria of change laid down in *Met*. IX, 6, e.g. building and teaching are directed to a goal and are incomplete until the goal is reached. While the builder is building, it is not true that he has built (1048b31) and similarly for teaching, so (according to the tense test) these are changes and not activities.

But it is precisely the self-destructive character of change that makes it a failed model for being in the primary sense of substance, even though it is structurally analogous to being. In Aristotelian terms, change is an incomplete *energeia* by contrast with complete *energeiai* like seeing and thinking. In the next section, I | will discuss this superior kind of *energeia*, which is a better [39] model for primary being. But, for the moment, let me reflect on the tragic fate of change, which is like some character in a play who is always condemned to commit suicide at the end of the final act. The tragic flaw in the constitutive actuality that is change is simply that it is always the actuality of a potentiality for something else besides itself. Therefore it is an incomplete *energeia* by definition, since its task is to become something else and in the process to destroy itself. Change is ἀτελές in the literal sense that it does not contain its own end, but is rather directed towards an end outside itself.

Given the aristocratic sensibility that underlies Greek philosophy, change is bound to be regarded as something of an underling in the scheme of things, since it is like a slave that serves the interests of his master. In terms of my title, change is not one of the powers that be, but rather is one that ceases to be. But, due to the fact that change is so central to Aristotle's concept of nature, its radically incomplete character constitutes a problem for his metaphysics of substance. Thus, in *Met*. III, 1, 996a10–11, he formulates a puzzle as to whether or not there is any other way of distinguishing between actuality and potentiality than with reference to change. From what we have seen it is clear that, if the answer is in the negative, then the central project of his ontology is in serious difficulty. As we can see from *Met*. IX, Aristotle tries to discover a more complete sense of *energeia*, guided by the *endoxon* that 'actuality is thought to be change especially' (1047a33). In other words, he makes his typical move from what is more familiar to us towards what is more familiar by nature.

VI. *The Distinction between* Kinêsis *and* Energeia

It is not quite clear whether this distinction is phenomenological or linguistic or perhaps both, but there is no doubt about its fundamental importance for Aristotle's philosophy. Later in the paper I will briefly outline its implications for his psychology and ontology; but first let me trace its development in a linguistic manner, so as to connect it with *dunamis*.

In *Met*. IX, 9, 1048b17 ff. Aristotle uses *praxis* as a general term to cover both *kinêsis* and *energeia*, whereas in the *Nicomachean Ethics praxis* is often contrasted with *poiêsis* and also with *theoria*. This vague general use of *praxis* seems to be like his usage of *kinêsis* as a general term to cover both activities and processes. However, *kinêsis* in the specific sense of change is not itself an end but is directed to an end. In other words, changes or processes are characterised by an external limit, e.g. slimness is the not-yet-achieved goal of the normal person who is slimming. While it is in process, a change is not complete since it is not itself an end. Incidentally, therefore, it could prove misleading to accept Blair's translation of *entelecheia* as 'having its
[40] end within' to refer to | the actuality of a change in process. By contrast, an *energeia* is that sort of *praxis* in which the end is already present, e.g. one is simultaneously seeing and has seen, or thinking and has thought in the same moment. Yet one is not simultaneously learning and has learned, nor healing and has healed at the same time. But, on the other hand, one is living well and has lived well, or is flourishing and has flourished.

So does the distinction depend entirely on the so-called 'tense test', as Ackrill (1965) thinks? According to this test, the present form of a verb denoting an *energeia* entails (or is at least consistent with) the perfect form of the verb; whereas in the case of a verb denoting a *kinêsis* such an entailment either does not hold or is even inconsistent. But, as Michael White (1980: 254) points out, the perfect verb form in the so-called 'tense test' may be semantically interpreted either in a temporal or aspectual way. He argues convincingly that the aspectual interpretation is the correct one and that it yields a different picture of Aristotle's paradigmatic activity of contemplation. Furthermore, he suggests that the 'tense test' does not categorically distinguish between verbs that denote activity and those which denote change. In fact, he offers a plausible interpretation of *Met*. IX, 6 which opens up the possibility that the present tense of a verb like learning may denote a *kinêsis*, while the perfect tense may denote an *energeia*.

It seems clear, therefore, that Aristotle cannot base his distinction entirely on the 'tense test' because by itself it is inadequate for determining the temporal characteristics that distinguish motions from activities. Mark Stone

(1985) argues convincingly that there is a sense in which activity is timeless, since it does not require time in order to be complete, whereas a motion does; so that a motion is in time, but an activity is not. Within the genus of *praxis*, therefore, motion is an incomplete action that has a limit and is directed to an end; while activity is a complete action because it has no limit and so is an end in itself. Thus, whereas every motion has to stop at some time, according to Aristotle, an activity can be eternal because it is complete at every moment. At *EN* 1174a14–b14 he argues that activities like pleasure do not require time because pleasure is a homogeneous whole, whereas motions like building can be divided into different parts. Thus, as wholes, pleasures are complete at each moment and so, like points on a line, are not in time but somehow coexist with time. Since an activity like seeing is a homogenous whole, no part of which is different from the other, it is not measurable by time because no part of it can be marked off as prior to another. Thus it is true to say that in the same moment one sees and has seen. In this way Aristotle can claim with some plausibility that human activities imitate divine activities like thinking, and this provides the opening to the eternal realm that constitutes his version of the Platonic *imitatio dei*.

From such a perspective, let us consider more carefully the distinction in IX, 6 between *energeia* and *kinêsis*. Given that potency with respect to change has already been discussed in IX, 1–5 (and V, 12), Aristotle proposes to | [41] examine activity (ἐνέργεια) both as to what it is (τί ἐστι) and of what sort (ποῖον τι). There is a quite different sense of *dunamis* (let us call it 'potentiality') besides that whose nature it is to change another or be changed by another, either simpliciter (ἁπλῶς) or in some other way (τρόπον τινὰ); and this other sense of *dunamis* is the real target in his inquiry into substance.

At *Met*. 1048a35 Aristotle tries to explicate this other schema of *dunamis* by induction through analogous examples. Perhaps because of the universality of such a schema, it is not accessible through definition; so he suggests that we intuit (συνορᾶν) it from different illustrations. Actuality and potentiality are related in the same way as the following: what is house-building to what can build, and what is awake to what is asleep, and what is seeing to what has sight but with eyes shut, and what has been separated out of the matter to what is the matter itself, and what has been worked up to what has not been thoroughly worked up. All five examples could exhibit the second schema of *dunamis*, which Aristotle brings under the general and non-technical sense of *kinêsis*, in order to underline the analogy with the first schema. M.L. Gill (1989: 216) suggests that, although all five examples belong to the second schema, they are intended to be analogous to examples proper to the first schema, i.e. two sorts of actualities: the complete actuality or product, and incomplete

actuality or change that yields the product. On the first schema, some of the actualities stand to potentiality in the way that change stands to potentiality, and some as substance (the product) to some pre-existing matter. Thus Gill argues that Aristotle clarifies the second schema by exploiting the analogy with the first; the second involves two sorts of actualities: one related to a potentiality as change is to potentiality (e.g. what is seeing to what has its eyes shut but has sight), the other as substance is to a certain generic or functional matter, e.g. what has been separated out of matter as related to its generic matter.

Hence *kinêsis* cannot here have a narrow technical sense, since it refers to a thing awake and seeing; and so it must be a general term that applies to change in the technical sense and to activity (which corresponds to motion in the second schema). Aristotle's point seems to be that like the first schema the second schema concerns one actuality that is a *kinêsis* and another that is a product. Yet the *kinêsis* proper to the second schema is not a change in the strict sense but an activity. Still, if the structures of the two schemata are parallel, then the second schema must involve a motion and a product as actualities, along with two kinds of potentialities—one active and the other passive.

Thus, at *Met*. 1048b6–9, Aristotle says:

> Things which are said to be in actuality are not all called so in the same manner but by analogy; that is, as A is in B or is related to B, so C is in D or is related to D. For, in some cases, actuality is to the potential as motion is to the power to move, in others, as a substance to some matter. (trans. Apostle)

[42] The medieval distinction between *analogia attributionis* (*pros hen* equivocal) and *analogia proportionalis* (same relation), is here being applied to the relation between change and *energeia* with reference to potentiality and actuality. The logical relation between the different senses of *dunamis* is now looser than in *Met*. V, 12, precisely because of the novel distinction between complete and incomplete *energeiai*.

Subsequently, at *Met*. 1048b18, Aristotle introduces this major distinction among actions (πράξεις) between change (κίνησις) and activity (ἐνέργεια): among actions that have a limit (πέρας), none is a completion (τέλος) but each is a sort of thing relative to the completion (περὶ τὸ τέλος), e.g. as slimming is related to slimness. The bodily parts themselves when they are slimming are changing in that respect, but that thing (slimness) for the sake of which the change happens does not yet belong to them (since it is not an action in the full sense or not a completion). By contrast, that sort of action in which its completion is contained within itself is a complete action (πρᾶξις),

e.g. in the same moment one is seeing and has seen, or one is understanding and has understood, or one is thinking and has thought.

This so-called 'tense test' involves the identity of present and perfect forms of verbs of activity, but it is a grammatical test that has profound ontological implications. In the case of processes of change, for instance, if you are learning, it is not the case that in the same moment you have learned, or if you are walking, you have not walked in the same moment. But this *is* the case for activities: e.g. someone is living well and at the same time has lived well, or someone is flourishing and has flourished at the same time. If that were not the case, flourishing would have had to reach a limit at some time (death does not count since it is not the goal of life):

> Of these processes, then, we must call the one set movements, and the other actualities. For every movement is incomplete—making thin, learning, walking, building; these are movements and incomplete. For it is not true that at the same time we are walking and have walked, or are building and have built, or are coming to be and have come to be—it is a different thing that is moving and has moved; but it is the same thing that at the same time has seen and is seeing, or is thinking and has thought. The latter sort of process, then, I call an actuality, and the former a movement.
>
> (*Met*. 1048b28–35, trans. Ross/Barnes)

An exception that might be taken to prove the rule is what the Germans call *Spazierungsaktivität*, e.g. taking a leisurely stroll after dinner along the old Philosophenweg in Heidelberg (now frequented mainly by tourists). Since one is not trying to get from point A to B but is rather walking for its own sake, this counts as an activity rather than a motion, e.g. walking to the railway station to catch a train. But this raises the question of whether the distinction between an activity and a motion is as sharp as Aristotle would like to make it, given that he | himself sometimes lists shipbuilding as an activity. The rule [43] of thumb seems to be that if the process yields a product that is external to the process, then it is a change rather than an activity.

In *Met*. IX, 8, Aristotle further clarifies this distinction through his claim that activity is prior to potentiality in many different senses. Just as with *dunamis*, Aristotle refers us back to V, 11 for the many different ways in which activity is prior to potentiality. By 'potentiality' he means not only that definite kind which is called the origin of change in another or in itself qua other (1046a11), but generally (ὅλως) every origin, whether movemental or static. For, as he explains, nature is in the same genus as potentiality, as it is a source of change (ἀρχὴ κινητική), except not in another, but in the thing itself qua itself. Furthermore, as he says later (1050a15), the matter is potential because it may *go into* the form, and when it exists actually

then it is *in* the form. And similarly in the other cases, including those in which the completion is a change. There is a parallel between nature in motion and teachers who show their pupils actually at work (ἐνεργοῦντα) as evidence of having reached a goal. Here Aristotle offers an etymological explanation: for the work (ἔργον) is a completion, and the actuality is the work, hence even the name '*energeia*' is said with respect to the 'ergon', and aims at completeness (πρὸς τὴν ἐντελέχειαν). What he suggests is that *energeia* means literally 'being at work', while '*entelecheia*' means 'having achieved its end'. Aristotle's solution to the problem about the unity of substance and definition is to be found in this thesis about the identity of potential and actual aspects in the activity of natural substances.

But more general implications for Aristotle's metaphysics follow from his claim that activity (ἐνέργεια) is prior to potentiality (δύναμις), both (1) in formula, and (3) in substance, whereas (2) in time, it is prior in one sense, but not in another sense.

So let us briefly explore these implications. Firstly, (1) it is obvious that activity is prior in formula (τῷ λόγῳ) for what is potential in the primary sense is potential because it admits of becoming active, e.g. 'capable of house-building' means that which can house-build, and 'capable of seeing' means that which can see, and 'visible' means that which can be seen; and similarly in other cases. Thus the formula and knowledge of the activity must precede the formula and knowledge of the other. In the case of living things, for example, the foetus is defined and known with reference to the mature adult.

Secondly, (2) in time (a) activity is prior in the following sense—that which is active (τὸ ἐνεργοῦν), being identical in species (τῷ εἴδει), though not in number (τῷ ἀριθμῷ), is prior to the potential cospecific thing it can produce. However, (b) to this individual man already existing in actuality, the matter which exists potentially but not yet actually, is prior in time. But still (a) prior in time there is some other thing which is in activity (ἐνεργείᾳ) from which this came to be. For always out of that which is potentially, that which is actually comes to be by the agency of that which is actually, e.g.
[44] man out of man, musician by the agency of | musician; always when some thing is moving first, and the mover already is actually. It is important here to note that Aristotle held the species form to be eternal and hence continually active.

Thirdly, (3) activity is also prior in substance (a) because the things that are posterior in coming to be are prior in form and in substance, e.g. the male adult is prior to the boy, and human being to seed, for the one already has the form and the other does not; and (b) because everything that comes to

be proceeds towards a first principle and a completion (τέλος). Since the final cause is a first principle and the coming-to-be is for the sake of the completion, and the activity is the completion, it is for the sake of this that the potentiality is acquired. For example, it is not that animals see in order that they may have sight, rather they have sight so that they may see, and likewise we have the house-building art so that we may house-build, and the theoretical capacity so that we may theorise; whereas people don't theorise so that they may have theoretical capacity, except students who are practising and who theorise only in a special sense. In some cases (i.e. *energeia*) the exercise/use (χρῆσις) is the final thing, e.g. for sight, the seeing, since nothing else comes to be from sight. But in other cases (i.e. *kinêsis*) something else does come to be, e.g. from house-building a house comes to be, apart from the activity which is not engaged in for its own sake.

In those cases where what comes to be is something different, apart from the exercise, the activity (ἐνέργεια) is in what is being made, e.g. the act of house-building is in that which is being house-built, and the act of weaving is in that which is being woven, and likewise also in the other cases. In general, the change is in the thing being changed. By contrast, in those cases where there is not some other work (ἔργον) apart from (παρά) the activity, then the activity is present in them (= the agents), i.e. the seeing is in the seer, and theory in the theoriser, and the life in the soul, and so is human flourishing (*eudaimonia*), for that is a certain kind of life. I will return to this point about human happiness as activity in my conclusion.

From all of this Aristotle concludes (1050b2) that it is evident that the substance and the form are activity (ἐνέργεια). In fact, according to the previous argument, it is evident that activity is prior to potentiality in substance, and in time one activity always precedes another until one reaches the activity of that which primarily and always causes movement. But (b) activity is prior in a stricter sense (κυριωτέρως) because eternal things are prior in substance to perishable things, and nothing potential is eternal. The reason for this is as follows: every potentiality is at the same time (a potentiality) for the contradictory (ἀντιφάσεως), for whereas that which is not capable of belonging cannot belong to anything, yet everything that is potential still admits of not being actual (μὴ ἐνεργεῖν). Therefore, being capable admits of both (actually) being, and (actually) not being; so that the same thing is capable of both being and not being. And that which is capable (δυνατόν) of not being admits of (ἐνδέχεται) of not being, and that is perishable (φθαρτόν), either simpliciter | (ἁπλῶς) or in just that sense in [45]
which 'to admit of not-being' is said, i.e. with respect to place, or quantity or quality or simpliciter (i.e. substance).

However, none of the things that are imperishable simpliciter are 'potentially' simpliciter, though nothing prevents this in a certain respect, i.e. being potentially so-qualified or placed, etc. Therefore, they are all in activity, nor can any of the things (be potentially) that exist of necessity (ἐξ ἀνάγκης), since these are primary (πρῶτα) and, if they did not exist then nothing would exist. Similarly, if there is any eternal movement (κίνησις), it cannot be potentially (i.e. in the sense of being capable of ceasing), or if there is any eternal thing-moved (κινούμενον), it cannot be moved by way of a potentiality, except as 'whither-whence' (ποθὲν ποί), since nothing prevents such a matter from being present. Hence the sun and stars and the whole heaven are always active (ἀεὶ ἐνεργεῖ), and there is no fear that they may stop sometime, as the natural philosophers fear.[28] Even though the heavenly bodies are always in motion, they do not tire because their movement is not connected with the potentiality of the opposites, as it is for perishables. For what causes hardship is the fact that substance is matter and potentiality, rather than activity. In my penultimate section, I will examine the special activity of the unmoved mover as Aristotle's first principle of the universe, but first I must discuss the activity of thinking within the most obvious context of our human life.

VII. *Perception and Thinking as* Energeiai

The central project of *De Anima* II is the definition of soul, which has been prepared for in Book I through a typical Aristotelian survey of previous opinions that is designed to produce puzzlement about the very nature of the soul. Since this is an ontological question, Aristotle introduces a preliminary division between different types of substance, namely, matter, form and composite. He clarifies this division by saying that matter is potential (δύναμις), while form is actuality (ἐντελέχεια), and this latter can be taken in two senses; either as having knowledge (ἐπιστήμη) or as exercising it in contemplation (θεωρεῖν). Thus from the very beginning the nature of the soul itself is connected by Aristotle with the exercise of its most characteristic powers. In other words, the very existence of the soul is dependent on the activity of certain powers which are embodied in a material substratum. Although there is a broad range of such powers ranging from the vegetative to the thinking capacity of the soul, I will focus exclusively on the exercise of cognitive powers like perception and thinking. Aristotle himself encourages

[28] This ancient fear seems to be also reflected in primitive sun observatories that survive from the Stone Age, such as Newgrange and Stonehenge.

us to examine these as the most illuminating activities of the soul, which is defined as the first actuality of an organic body potentially having life | [46] (412a27–28: ἐντελέχεια ἡ πρώτη σώματος φυσικοῦ δυνάμει ζωὴν ἔχοντος). But actuality is said in two senses: 1) as a habit of knowledge (ὡς ἐπιστήμη), and 2) as actually contemplating (ὡς τὸ θεωρεῖν). Thus soul is an actuality in the first sense, as it is present when asleep, just as much as when awake. While being awake is analogous to contemplation, being asleep is analogous to the having (τῷ ἔχειν) but non-exercise (μὴ ἐνεργεῖν) of knowledge. Both the example and the set of parallels are already familiar from the *Protrepticus*, except that here in *De An*. II, 1 Aristotle seems to be suggesting that these are two distinct senses of *entelecheia* rather than of *energeia*.

But he uses the terms interchangeably in *De An*. II, 5 where he considers the nature of sense-perception as a whole, which is generally held to be a sort of alteration because it takes place as a result of being moved or of being affected. So the background which Aristotle explicitly assumes is his discussion of active and passive processes (416b32–33). However, the aporia which he first addresses is why there is no perception of the senses themselves, without the help of external objects, given that their organs contain fire and earth and other elements which constitute objects of perception. His solution is to say that the sense faculty does not exist in activity (ἐνεργείᾳ) but only in potency (δυνάμει); so that it must have an external object to activate it. He draws a parallel with combustible material, which does not burn by itself without the presence of an incendiary agent. It is in this context that Aristotle introduces (417a9 ff.) the crucial distinction between two senses of perception, i.e. the capacity of someone to perceive, even if they are asleep, and the exercise of that capacity by someone who is actually perceiving.

This leads him on to a more general set of distinctions between potentiality and actuality, which are designed to resolve the outstanding puzzles about whether perception and thinking result from the action of like upon like or by like upon unlike. The answer is a classic Aristotelian compromise: in one sense by like upon like, but in another sense by like upon unlike. But it is impossible to understand this answer properly without grasping the intricacies of his distinctions between potentiality and actuality, introduced with reference to different levels of knowledge. In the minimal sense, a human being may be described as a knower (ἐπιστήμων) because he belongs to the class of beings that are intelligent and hence potential$_1$ knowers. At the next level a man may be spoken of as knowing only after he has learned the rudiments of grammar, for instance. This man is a potential$_2$ knower in a different sense to the human being who simply has the natural

capacity for learning grammar without ever having exercised it. But it is true of the potential$_2$ knower that he could apply his knowledge of grammar if no obstacle prevented him; so that he is an actual$_1$ knower in a certain sense. However, the person who is an actual$_2$ knower in the full sense is the one who is realising his knowledge through specific acts of grammatical knowing.

In contrast to this fully actualised state of knowledge, the other two states may be described as potential, but there is an important difference between
[47] them. In | order for the potential$_1$ knower to become an actual$_1$ knower, it is necessary for his soul to be changed through learning from a state of ignorance to the contrary state of knowledge. In many ways, this is akin to a physical change in which a subject is transformed from a state of privation to a contrary informed state. It is a temporal process that involves the destruction of the opposite state; so that the whole is incomplete in an important sense. This can also be applied to the process by which the passions are shaped into a fixed disposition for acting rightly that Aristotle calls virtue. By contrast, the transition from potentially$_2$ knowing to actually$_2$ knowing is instantaneous (if there are no obstacles) and involves the preservation of the original power rather than its destruction. The latter is for Aristotle a paradigm example of what I have called the 'powers that be', as it supplies him with a conceptual model for thinking about the activity of substantial form in relation to matter. Similarly, the exercise of the virtues is such a conserving activity.

Aristotle draws a parallel distinction for 'suffering' (πάσχειν): one is a kind of destruction (φθορά) by the opposite, e.g. of ignorance by knowledge; whereas the other is rather a preservation (σωτηρία) of that which exists potentially by what is actual and similar; just as potential capacity stands to actual reality. For instance, that which has knowledge comes to be in contemplation (θεωρεῖν), and this is either not alteration at all, since its advance is towards itself and its own perfect fulfilment (417b6–7: εἰς ἐντελέχειαν) or it is a different kind of alteration. Thus Aristotle insists that it is not correct to say that a thinking being is at the time of thinking undergoing alteration, any more than the house-builder is being changed when he is building (the exercise of an acquired art is not a change). Hence, he argues, the process which transforms what is potential into what is actual in relation to a reasoning and thinking being should not be called instruction (διδασκαλία) (as this would imply some alteration from ignorance to knowledge), but should be known by some other name. Similarly, that which on the basis of what is merely potential learns and receives knowledge at the hands of that which is actual and capable of teaching (an example of the priority of the actual over the potential) should not be spoken of as 'suffering' (πάσχειν) an impression, or else we must recognise two different forms of alteration: 1) a

transition into the merely negative phase of a previous state (417b15); 2) a transition into the established and natural condition (417b16).

In general, the first is a typical form of change in inanimate things, whereas the second is characteristic of living things. In the sensitive subject the first form of transition is effected by the generating parent. After birth, however, the subject comes to possess sensation in the same way as scientific knowledge (ἐπιστήμη). The actual exercise (κατ' ἐνέργειαν) of sense is parallel to that of thought (τῷ θεωρεῖν), except that in the case of sense it is external objects that stimulate the faculty into action. The reason for this is that sense-perception in activity deals with individual objects (τῶν καθ' ἕκαστον), whereas scientific knowledge deals with universals (τῶν καθόλου), and these are in a way (πῶς) | within the mind itself. Another crucial difference between [48] sensation and intellection is that it is within one's power to think whenever one wishes, whereas sense-perception is not under one's control because the object of sense must be present beforehand (417b25—another example of the priority of the actual over the potential). The same holds good also of sciences that deal with sensible phenomena, and for the same reason, i.e. that the objects of sense are individual and external.

In summary, we can take Aristotle's discussion to have distinguished between the following senses of potency: the way we can speak of a boy as potentially$_1$ a general; and the way in which a mature man is potentially$_2$ a general. In the first case, there must be an alteration involving time but not in the second case, as the mature man can immediately act as a general if there are no (external) obstacles. Aristotle tries to apply the same distinction to sense perception by using current terms like 'impression' (πάθος) and 'alteration' (ἀλλοιοῦσθαι), as he feels his way towards the technical distinction between *kinêsis* and *energeia*.[29] The faculty of sense-perception is potentially what the object of sense is actually (*De An*. 418a2–3). With regard to the puzzle about like and unlike, Aristotle's solution is that during the process (πάσχει) of perception, the faculty of sense is not similar to its object, but after the impression (πεπονθός) it is assimilated to and becomes like it. This also solves the other puzzle about why a sense faculty does not perceive its own organs.

Let us now explore the implications of this set of distinctions for Aristotle's concept of *nous*, in the hope of gaining some insight into his famous division

[29] In general, any change or motion takes time, whereas an alteration like the freezing of a small lake can be instantaneous. At *De Sensu* 6, 466b2–10 Aristotle makes the point that perception itself is an *energeia*, presumably because it is instantaneous, whereas the mediation of a sense-quality is a *kinêsis* that takes time.

between active and passive *nous* in *De An*. III, 4–5. At the outset he identifies *nous* as that part of the soul by which it knows and judges rightly, leaving open the question of whether it is separate in magnitude or only in definition. As far as possible, however, I want to avoid the scholarly controversy about how Aristotle answers this question, so as to focus on his account of the nature of *nous* and how it functions. His initial assumption (which is later carefully qualified) is that thinking is like perception, and hence that it is affected (πάσχειν) by an object of thought in a similar fashion. The explicit implications drawn from this parallel with perception is that the thinking faculty, even though it is impassive (ἀπαθές), must be receptive (δεκτικόν) of intelligible form; and so potentially (δυνάμει) like it but not actually identical with it (*De An*. 429a15 ff.). Therefore, Aristotle concludes, *nous* must be free of all mixture, since (unlike perception) it thinks all things without restriction, and the prior presence within it of anything foreign to it would obstruct its proper functioning. Hence its nature is simply the capacity (δυνατόν) for thinking, and *nous* is nothing in actuality before it thinks (429a24: οὐθέν ἐστιν
[49] ἐνεργείᾳ τῶν ὄντων πρὶν νοεῖν). Aristotle finds it reasonable, | therefore, that *nous* should not have any corresponding physical organ, as the resulting mixture with body might give it some intrinsic quality like hot or cold. He approves of the Platonic saying that the soul is 'the place of forms', as long as this is applied only to the thinking part, which is not actually (ἐντελεχείᾳ) but only potentially (δυνάμει) identical with the intelligible forms.

In terms of the framework established in *De An*. II, 5, we should inquire about the level of potency which Aristotle assigns to *nous* that is not yet active. We can work back from the sort of activity he assigns to *nous*, when he says that it becomes each of its objects in the same way that a scientist (ὁ ἐπιστήμων) is said to know actually (κατ' ἐνέργειαν), namely, when he can exercise his knowledge by himself (429b7: ὅταν δύναται ἐνεργεῖν δι' αὑτοῦ). Thus *nous* as activity$_2$ is the exercise of an acquired disposition (potency$_2$ = act$_1$), and it is only when it is such a *hexis* that it can think itself. At the first level of potency, before the scientist has acquired any knowledge, his soul is dependent on stimulation from external objects which is provided by the senses and other faculties related to the body. But there is a sense in which *nous* is independent of the body at the second level of potency because, having acquired universal knowledge, the scientist can apply it at will, as long as there are no internal obstacles.

But there is a problem about the impassivity of *nous*, as conceived by Anaxagoras, which Aristotle formulates as follows (429b22 ff.): If *nous* is simple (ἁπλοῦν) and impassive (ἀπαθές), having nothing in common with anything else, how can it think anything, given that thinking is a kind

of passivity (πάσχειν τι)? The basis for this puzzle is the old Presocratic intuition that it is only insofar as there is something in common between two things that the one is said to act (ποιεῖν) and other is said to suffer (πάσχειν). For his proposed solution, Aristotle once again draws on the previous distinction between potency and act by saying that, in a way, *nous* is potentially identical with intelligible objects, though it is actually nothing before it thinks (429b30–31: ὅτι δυνάμει πώς ἐστι τὰ νοητὰ ὁ νοῦς, ἀλλ' ἐντελεχείᾳ οὐδὲν, πρὶν ἂν νοῇ). By way of illustration, he draws the well-known parallel between *nous* and a *tabula rasa*, i.e. the process of thinking is like that of writing on a tablet on which nothing has actually (ἐντελεχείᾳ) been written as yet. So Anaxagoras was right in a way about *nous* in this potential state, as it is impassive and different from everything else. But he was wrong to overlook the fact that it is potentially like all other things, which it can actually receive one at a time, just as letters can be written on a wax tablet. This is the way in which *nous* can think all other things (and be like them), while retaining its own impassive nature (and thus be unlike them).

This brings me to the infamous *De An.* III, 5, which I will consider only from the narrow perspective of how potency and actuality occur in its rather dense argumentation. The general topic of the chapter is how *nous* is structured so as to function in the manner described in the previous chapter, especially in the light of Anaxagoras' claim that *nous* is simple. Aristotle begins with a general parallel between divisions in nature and in the soul, but then applies the same distinctions | to *nous* as if it were also a natural entity like the soul. [50]
What he says is that in each natural genus there is something like matter, which is potentially (δυνάμει) all things, and something like a productive cause that makes all things, just as a craft is intimately related to the material on which it operates. Therefore, he argues, the same differences must belong in the soul; so that there is a kind of *nous* that becomes (γίνεσθαι) all things and a kind that makes (ποιεῖν) all things. The latter kind of *nous* is described as a sort of disposition (ἕξις τις) that is analogous to light, in the sense that light makes potential (δυνάμει) colours into actual (ἐνεργείᾳ) colours.

In order to avoid the shoals of controversy, once again, let me simply note that Aristotle describes this active kind of *nous* as being separable (χωριστός), impassive (ἀπαθής) and unmixed (ἀμιγής), whose very substance is an activity (430a18: τῇ οὐσίᾳ ὢν ἐνέργεια). By way of explanation, he says that what acts (τὸ ποιοῦν) is always more honourable than what is acted upon (τοῦ πάσχοντος), just as a principle is more honourable than matter. It would appear that Aristotle here appeals implicitly to some criterion of priority, so as to establish that active *nous* is prior to passive *nous*. The point of such an appeal is not immediately obvious, though it might make sense when connected to the

subsequent distinction between active and potential knowledge. Aristotle concedes that, within an individual knower, potential knowledge may be prior in time to actual knowledge, given that a learner must first acquire some knowledge before it can be actualised at either of the two levels previously distinguished. But he also insists that generally (ὅλως) actual knowledge is prior in every sense, including priority in time, precisely because it is eternal or independent of temporal process. This seems to be the drift of Aristotle's obscure claim that it (active *nous*) does not at one time think, and at another time not think (430a22). Such a timeless activity of thinking is facilitated by the fact that actual knowledge is completely identical with the thing known in the moment that it knows it. In that timeless moment when human knowledge grasps its object completely, it imitates the eternal activity of the divine mind which is always identical with its object.

This appears to be the line of thought which leads Aristotle to make the historically controversial claim that *nous* is the only part of the human soul that is deathless and eternal (ἀθάνατον καὶ ἀΐδιον). But it is unclear whether he is talking about *nous* as a whole or only of the active part of *nous*. That depends very much on whether only one part of *nous* can be separated (χωρισθείς), so as to become just what it is (ὅπερ ἐστί) (430a22–23). If the text as we have it is reliable, Aristotle distinguishes between active *nous*, which is completely impassible and whose activity we cannot remember, and passive *nous* which is destructible along with the body and whose activity we do remember. But that renders quite mysterious the referent of the concluding sentence of the chapter: 'and without this (ἄνευ τούτου) nothing thinks'. If Aristotle is referring exclusively to active *nous* then he may be emphasising its priority as the principle that initiates all thinking, but he cannot be saying
[51] that it is sufficient for thinking. However, if he | is simply referring to *nous* as a whole then he is making the rather obvious point that such a faculty is necessary for thinking. On the other hand, if he is referring exclusively to passive *nous* then his claim must be that this a necessary but not a sufficient condition for thought.

But I think that these puzzles cannot be resolved if we take *De An*. III, 4–5 out of its general context, which is the discussion of human thinking as analogous to human perception. Perhaps we can restore that context by considering Aristotle's discussion in *De An*. III, 6 of the distinction between discursive and non-discursive thought. The latter is the thinking of 'indivisibles' and so does not involve truth and falsity because that applies only to combinations, such as the proposition that 'Cleon is white'. Just as friendship is the uniting agent for body parts according to Empedocles, so for Aristotle *nous* is the active principle for combining such things as

make up the unity of a proposition (*De An*. 430b5–6). Obviously he has in mind the active part of *nous* as an efficient cause of knowing propositions as unities in discursive thought. This fits his standard pattern according to which something which is potentially knowable becomes actually knowable through the agency of *nous*.

But he is much more interested in establishing the possibility of non-discursive thought, which does not seem to fit the standard pattern precisely because it involves the thinking of indivisibles. Aristotle's solution is to distinguish between potential and actual indivisibles, and then to make a corresponding distinction for thought. In order to understand his point, it is important to note that the modes of being of the object of thought determine the modes of thinking. Since things may be indivisible in two ways, either potentially (δυνάμει) or actually (ἐνεργείᾳ), he claims that nothing prevents *nous* from thinking the indivisible, e.g. thinking an indivisible length in an indivisible moment. Even though the length is potentially divisible, it is not possible to say in half the time what *nous* is thinking because both length and time are not actually divided. But if *nous* thinks each half of the length separately (χωρίς) then it divides the time also, given that both time and length are similar continua. However, in the case of things that are indivisible in kind, instead of in quantity, *nous* always thinks them in an indivisible time and by an indivisible act of the soul (*De An*. 430b14–15).

Aristotle does not give any examples of indivisible forms which are grasped thus by *nous*, but he does use the point as an example of an indivisible that is known by means of a privation. Just as in the case of evil or black, one knows such an indivisible by means of its contrary; so that it is known potentially (δυνάμει) in this way. But, as Aristotle points out, if there exists among causes something in which there is no contrary, then this thing knows itself and exists in actuality and is separate (430b24–26: αὐτὸ ἑαυτὸ γινώσκει καὶ ἐνέργειά ἐστιν καὶ χωριστόν). This appears to be an important exception that may refer to a prime mover that has no contrary nor any trace of potentiality because it never changes (*Met*. 1075b20–22). If that is the case then Aristotle seems to be suggesting | that divine thinking is analogous to the activity which [52] human *nous* engages in when it grasps the whatness or essence of something apart from its matter (*De An*. 430b27–30). This does not involve propositional thinking in which something is predicated of something else (τὶ κατὰ τινός) but is rather like our direct perception of a proper sensible, i.e. one either sees it or one does not.

At the beginning of *De An*. III, 7, Aristotle repeats almost verbatim the rather puzzling sentence that we stumbled over in *De An*. III, 5, 430a19–22, but makes an important change at the end by offering an explanation as to

why potential knowledge is not even prior in time, when taken as a whole. It may help to quote the passage in full:

> Actual knowledge is the same as the object [of knowledge]; potential knowledge, however, is prior in time in any single [individual], but, as a whole, it is not [prior] in time, for all things which come into existence do so from things which exist actually. (431a1–4, trans. Apostle)

The line of thought here is not quite perspicuous, but let us begin with the final explanation and then connect it with the initial claim about the identity of actual knowledge with its object. Aristotle's explanation cites the general axiom that everything which comes to be does so from something that already exists in actuality (ἐντελεχείᾳ), e.g. an actual human being generates another human being. Thus, although it appears that a potential human being must be prior in time to an actual individual human being, yet this is not so as a whole because there is always some actual member of the species that generates another member. But how is this example relevant to whether potential knowledge is prior in time to actual knowledge?

The point seems to be that, at the level of the individual knower, it would appear that potential knowledge is prior to actual knowledge because there must first exist a capacity for knowing before it is activated by the knowable object. As a whole (ὅλως), however, this cannot be the case precisely because of the identity of the knower with the object of knowledge that is characteristic of active knowing. Since knowledge and the object of knowledge are numerically one, they exist simultaneously in the soul as a universal that is applied to a particular. But the knowable thing is generally prior in time to the knowledge of it, given that things which exist of necessity are prior in time to knowledge of them (*Cat.* 7b22). The ambiguity arises from the fact that the term 'known' has two distinct senses, i.e. as existing in the soul and as something external to the soul. In the first sense, there is a numerical identity between the knower and the known thing insofar as it is known. But in the second sense the knowable thing may exist either outside the soul or in it (e.g. as universal object), but it is not actually being known. Thus it is the first sense of 'known' that Aristotle has in mind in the above passage when he asserts that actual knowledge is identical with the object
[53] of knowledge. However, | the careful distinction between priority in time within an individual, and as a whole, applies more to the second sense of 'known'.

This tends to be confirmed by the parallel which Aristotle goes on to draw between thinking and sense perception. He finds it obvious that the sensible object (τὸ αἰσθητόν) causes (or makes—ποιοῦν) the faculty of sensation (τοῦ

αἰσθητικοῦ) to become actual (ἐνεργείᾳ) out of its previous potential state (ἐκ δυνάμει). But he hastens to explain that the faculty of perception is neither affected (πάσχει) nor altered, since its activity involves a different kind of motion (ἄλλο εἶδος … κινήσεως). Whereas the ordinary kind of motion involves the actuality of what is incomplete (τοῦ ἀτελοῦς), this other sort of unqualified motion involves the actuality of what is complete (τοῦ τετελεσμένου) (431a6–7). Clearly, what Aristotle refers to here is the distinction between *kinêsis* and *energeia*, which he elaborates in *Met.* IX, 6. The relevance of the distinction as applied to the faculties of perception and thought is that their activities do not involve change in the strict sense because that is from contrary to contrary. If these faculties were to be affected or altered, however, they would be injured or destroyed rather than preserved as they normally are through their activities. So if a change is an incomplete actuality that reaches an end other than itself, then the activity of perceiving or thinking must be a complete actuality whose end is nothing other than itself, i.e. the exercise of perception or thought. This fundamental ontological difference between change and activity is borne out by the different way that we speak about them, e.g. one sees and has seen simultaneously, but one does not build and have built something at the same time (*Met.* 1048b30–35).

In *De An.* III, 8 Aristotle gives a concise summary of his previous discussion, which also enables us to tie together some of the strands that we have been teasing out so far. First, he repeats the maxim that soul is identical with all things but only in a certain way that needs to be specified carefully (*De An.* 431b21). Just as there is a strict correspondence between perception and its perceptible objects, and between knowledge and its knowable objects, so also there is an exact parallel between their different modes of being. In order to avoid any Kantian misunderstandings, however, it is important to note that for Aristotle the mode of being of the object determines the mode of being of the faculty, and not vice versa. This is clear when he says that knowledge and perception is divided (τέμνεται) in the same way as things (πράγματα), i.e. as things that exist potentially (δυνάμει) they correspond to potential things, while as things that exist actually (ἐντελεχείᾳ) they correspond to actual things (*De An.* 431b24–26). More specifically, he insists that the sentient (αἰσθητικόν) and the knowing (ἐπιστημονικόν) powers of the soul are potentially (δυνάμει) identical with sensible (αἰσθητόν) and knowable (ἐπιστητόν) objects, respectively.

But the assertion of strict identity needs to be qualified in the case of composites, as the soul might be identical with these things or their forms. For instance, in the case of sensible composites like a stone, the soul must be identical with its | form rather than the composite thing itself. Although [54]

he does not say so here, Aristotle holds the same to be true for intelligible composites such as mathematical objects, which are composed of intelligible matter and form. Within this context, however, the comparison he wants to make is between the soul and the human hand. Just as the hand is the instrument of instruments (ὄργανον ὀργάνων), so also *nous* is the 'form of forms' (εἶδος ειδῶν) and perception is the 'form of sensibles' (εἶδος αἰσθητῶν). The point of the comparison seems to be that, in the same way that the human hand gives us the capacity to use tools, so the faculty of perception enables us to grasp sensible forms, while *nous* allows us to grasp intelligible forms. But, just as having a stick lying around is different from using it as a tool by taking it in hand, so the mode of being of perceptible objects is different from that of perceived forms, i.e. the latter exist in the soul but the former do not. But it is more difficult to distinguish between the mode of being of intelligible objects and that of intellected forms, since both are dependent on the soul in a way. Still the logic of Aristotle's comparison is that intelligible objects have a potential mode of being (e.g. as universals in the mind) until they are actually thought and are thereby made identical with *nous*.

The striking analogy between *nous* and the human hand strongly suggests a biological context where man is treated as a natural being endowed with appropriate instruments for realising specific capacities for learning (*PA* 687a8 ff.). Aristotle sees the characteristic activity of nature as the perfecting of inherent powers, just like giving a flute to one who has the ability to play and thereby to use it properly. This is a constant theme which we find repeated from the *Protrepticus* onwards. When the analogy with the hand is applied to *nous*, it can be described as a natural instrument for grasping the intelligible forms of things, just as perception is a tool for grasping sensible forms. Such functional talk about instruments is particularly apt for both the intellective and sense faculties, which Aristotle has previously described as impassive and unmixed.

VIII. *The Unmoved Mover as Pure Activity: The Highest of the Powers That Be*

In order to tell the full story of why Aristotle found it necessary to posit an unmoved mover as the coping-stone of his cosmos, one would need to review the arguments from motion in *Phys*. VII–VIII. But, for the sake of brevity, I shall assume familiarity with these arguments while referring to them occasionally, as I discuss the more detailed description of the unmoved

mover given in *Met*. XII. This whole book is a good illustration of Aristotle's typical strategy of moving from what is more familiar to us to what is more intelligible by nature. Thus, the first five chapters are given over to a review of the principles of sensible substance, which may be read as a preparation for the move to supersensible | substances. In Chapter 2, for instance, when [55] discussing types of change in the sensible world, Aristotle underlines the role of matter as a substratum for the transition from privation to form with respect to each kind of change. This is consistent with the *Physics* where all change is analysed as being from the potential to the actual, or from that which is not (actually) but still is (potentially). Within the present context, he also refers critically to predecessors like Anaxagoras and Democritus, whom he takes to have posited matter as an original mixture that is a potential rather than actual state of the universe. His implied criticism of such materialists is that if everything was potential in the beginning then there is no good reason why anything should ever have been actualised. For the moment, I simply want to note the close connection which Aristotle consistently makes between matter and potency (cf. 1070b12–13).

Subsequently, in Chapter 5, he claims that all things have the same principles by analogy, namely, as potential and as activity (ἐνέργεια), though they are specifically different for different cases and apply in different ways. In the light of our previous discussion, we can classify the two main ways in which these apply: a) in some cases the same thing is at one time actual, b) at another potential. For instance, in the case of man, the form, privation and the compound are actual, while the matter is potential, since it is that which is capable of becoming these. This is clearly an illustration of what Aristotle calls a complete activity, where actuality and potentiality are related as substantial form to some matter. In other cases, however, the relation between potentiality and actuality is different where there is not the same matter, and where the form is also different. For instance, the cause of a man may be his father (different matter) or even the motion of the sun in the ecliptic (different form and matter). Obviously, this corresponds with the relationship between potentiality and actuality in change as an incomplete activity. This distinction has a direct bearing on the argument for an unmoved mover.

At the beginning of XII 6, Aristotle begins with a series of statements that we might treat as assumptions that ground the subsequent argument for the necessity of an unmoved mover. First, he declares that substances are the first of all things, and if they are all perishable then everything is perishable. But, he asserts, it is impossible that motion should either come into being or cease to be, for it must always have existed (as he has argued in the *Physics*).

Furthermore, time cannot come into being or cease to be, otherwise there could be no before and after. Since time is closely connected with motion, they are continuous and eternal in the same way. But, he argues, if there is something which is only capable of moving things or acting on them, but is not actually doing so (μὴ ἐνεργοῦν), then there will not be movement, since that which has a capacity need not exercise it (1071b13–14). This is the appropriate moment to recall that Aristotle criticised his predecessors for positing matter as prior, by objecting that nothing would ever come to be out of such states of potency. Hence it is necessary to posit a prior active
[56] principle which, unlike Plato's Forms, functions as a principle | of movement, otherwise there will not be motion in the universe. Furthermore, as long as such a principle has potency in its substance, it will not be sufficient for eternal motion, even if it is currently in activity; since that which exists potentially may possibly not be. Therefore, one must posit a principle whose essence is activity, and this means a substance without matter, since such a substance will involve eternal activity. This is nothing else than the unmoved mover.

But Aristotle immediately (1071b22) raises a difficulty for such a conclusion based on the apparent priority of potency to activity. This puzzle also situates Aristotle's position with respect to the views of his predecessors, which are partially constitutive for the whole difficulty. The logical basis for the objection is what I would call the criterion of non-reciprocal dependence, which is applied as follows: since everything that is in activity seems also to be possible, but not everything that is possible is in activity, therefore potency appears to be prior. In that case, however, it is possible that nothing may exist, for it is always possible that what is in potency may never come to be. According to Aristotle, the difficulty facing the materialists is to explain how anything gets going from the initial mixture or from atoms and the void. As Aristotle puts it, how can matter be set in motion if there is not some cause of its being in activity. For example, the wood does not move itself but rather is set in motion by the carpenter's art; just as the menses is moved by the sperm, or the earth is moved by the seed. At least some predecessors, such as Leucippus and Plato, saw this point when they posited eternal motion. However, they do not specify its cause nor say what kind of motion it is, nor the cause of the motion being the particular kind that it is. Against the Atomists, Aristotle insists that nothing is moved at random, since there must always be something present that moves one thing by nature, or another by force, or another by mind, and so on.

Among all of these pressing questions, the most crucial for Aristotle's argument is what kind of motion is primary, as he underlines when he says

(1071b37) that this makes all the difference. We know from *Phys*. VIII that he holds circular motion to be primary, but of course Plato also held this, so what is the difference in their views? Aristotle criticises Plato for being unable to clarify what he sometimes supposes to be the source of motion, namely, the soul which moves itself. Thus, for instance, Plato reputedly makes the soul secondary and simultaneous with the universe. As a small concession to his predecessors, Aristotle concedes that there is one sense (i.e. temporal) in which potency is prior to activity, but he insists that there is another (more important) sense in which it is not. The latter intuition is supported by Anaxagoras who made *nous* prior as an activity, and by Empedocles who posited love and strife as prior. Since activity is prior to potency it is a mistake to assume, as the mythologists do, that chaos or night have existed for an infinite time. Even if there is an eternal cycle of unchanging things, something must always remain active in the same; whereas if there is a cycle of generation and corruption, something must be always active in different ways. In Aristotle's cosmology, the most obvious candidate for an unchanging eternal cycle | is the diurnal motion of the heavens, while [57] the opposite motions of the sun and planets along the ecliptic is the most apparent candidate for a cycle of generation or corruption. This is what Plato called the cycle of the Same and the Different.

Therefore Aristotle takes it to be true, not only in theory but also in fact, that there is something which is always moved with an unceasing motion, namely, the circular motion of the first heaven. But he takes an important step beyond Plato's conception of the heavenly bodies as self-movers when he insists that there must be something else that moves them. The argument which he gives is very brief and requires some unpacking. Since the first heaven is moved and also moves something else, then it is an intermediate in Aristotle's classification; so that there is also required something which moves but is not itself moved. In effect, these conditions lead directly to his conception of the unmoved mover, which is eternal and a substance and activity (1072a25: ἀΐδιον καὶ οὐσία καὶ ἐνέργεια). But such an entity cannot move anything else by contact, otherwise (as we know from the *Physics*) it will be moved by reaction. So Aristotle must find an alternative model for causing motion, and for this he appeals to the way in which an object of desire or an object of thought can move the relevant faculties without themselves being moved. But this is more than a good analogy because he insists that the primary objects of desire and of thought are one and the same, namely the good. Of course, *nous* is moved by any object of thought but for Aristotle there is a hierarchy of such objects with substance being primary. Furthermore, within the category of substance, there is another

hierarchy in which the primary place is occupied by a substance which is simple and in activity. It is here that both ontological and value hierarchies within Aristotle's system coincide in a wondrous fashion which demands our closest attention. The parallels with *De An.* III, 5 should also be quite obvious.

But, once again, I will confine my attention to the role of potentiality and actuality in Aristotle's account of the unmoved mover and its activity. As noted above, he asserts that thinking (νόησις) in itself deals with what is best in the fullest sense. But he also claims that, when it is engaged in such activity, *nous* also thinks itself. By way of clarification, he explains that *nous* becomes an object of self-reflection by touching (θιγγάνων) its object in thought; so that thinking and the object of thought are identical. On the one hand, *nous* is capable of receiving an object of thought, but it is active (ἐνεργεῖ) when it has the object; and it is the latter state of *nous* which is rightly regarded as divine, since contemplation is most pleasant and best. But we can only engage in such divine activity occasionally, whereas God is always in such a state, and this compels our admiration of such a divine life. Aristotle insists that life (ζωή) also belongs to the divine, since the activity of thought involves life. Therefore the divine life is nothing else than the activity of thinking the best eternally. This is confirmed by the *endoxon* that God is a living being, eternal and most good: so that life and continuous duration belong to the divine.

[58] It is clear that Aristotle regards his problems as solved when he installs a pure actuality without any trace of potentiality at the pinnacle of his cosmic hierarchy. But there is a small problem about the nature of divine thought, which he considers in XII, 9 as an addendum to his previous discussion. Crudely stated, the problem is what the divine thinks about in its eternal activity. On the one hand, if it thinks nothing there seems to be nothing more admirable in it than in a sleeping beauty; whereas, on the other hand, if it thinks something then it appears to depend on something else. But the latter case implies that its essence is not the activity of thinking but rather a capacity to think; so that it would not be the best substance, since it is through thinking that it gets its value. Furthermore, even if one identifies its substance with the activity of thinking, there is still the question what it thinks of. The logical possibilities are as follows: either 1) itself or 2) something else, and 2a) either the same thing always or 2b) something different.

Having set up this complex aporia, Aristotle introduces some considerations which eliminate many of the logically possible solutions. For instance, it would be inconsistent with the philosophical conception of the divine that it should think any disgraceful or even any chance thing. It seems obvious that it must think only that which is most divine and precious. In addition, it does

not change, as this could be only change for the worse. In the light of these considerations, Aristotle argues that divine *nous* cannot be simply a capacity, otherwise the continuation of its thinking would be wearisome to it, and there would be something else more precious than *nous*, namely, the object of thought. Therefore, divine *nous* must be an activity and it must think only itself, since there is nothing better to think. Consequently, its thinking is a thinking on thinking (ἡ νόησις νοήσεως νόησις).

Once again, it may appear that we have reached a high watermark of nonsense that lends itself to ridicule by some modern Molière. But Aristotle's conclusion is quite consistent with his general principle of the priority of actuality over potentiality, and there is a peculiar phenomenological plausibility to it, if we view divine thinking as a perpetual version of what we would call self-reflection. In most cases of human cognitive activity, whether that be perception, opinion or understanding, the self-reflective aspect is secondary, since attention is focused on the cognitive object. However, in the case of more abstract objects, where the thought is identical with the object of thought, the self-reflective character of thinking becomes more apparent. It is one of the most delightful and wonderful features of the human mind that it can produce at will such a multitude of intelligible objects to contemplate. It seems to me that Aristotle has expanded this feature in his conception of the divine as the continually active power of noetic self-reflection that exists eternally. It is the highest of the Powers that Be.

Conclusion: Happiness as Imitatio Dei [59]

Finally, let me try to make Aristotle's strange view a little more plausible by connecting it with his conception of the highest form of human happiness as contemplation. For this purpose, I will refer briefly to some passages in *Nicomachean Ethics* X, 6–7, where Aristotle argues that this is a higher form of happiness than that associated with the practical political life, which is the normal form of a human life. A crucial step in his argument is the plausible claim that happiness is not a state (ἕξις) or passive disposition like sleeping, but is rather an activity (ἐνέργεια) that is desirable for itself and not for the sake of something else. The important criterion being used here is the old aristocratic one of self-sufficiency, i.e. that happiness should not lack anything or be for the sake of something else. Thus Aristotle claims that those activities are desirable in themselves from which nothing is sought beyond the activity itself, e.g. virtuous actions are thought to be such because to do noble deeds is something that is desirable for its own sake. This claim

not only reflects the Greek aristocratic ideal, but held an abiding appeal for philosophers through the ages, for example, Kant.

Aristotle's argument continues as follows: if happiness is activity in accordance with excellence, it is reasonable to assume that it will be in accordance with the excellence of the best thing in us. But, as we have already seen from *De An*. III, 5 and *Met*. XII, 6–9, he claims that *nous* is the best thing in us, since it is the most divine. Thus he argues that the activity of *nous* in accordance with its proper excellence will constitute complete happiness, and this activity is nothing else than contemplation. Aristotle offers a series of considerations to show that this view is not only consistent but is also true. Firstly, he claims, this activity is the best because *nous* is the best thing in us and its objects are also the best among knowable objects. Secondly, it is most continuous, since we can contemplate truth more continuously than we can do anything else. Thus it is the human activity that most closely approximates to the eternal activity of the heavens and of the divine. Thirdly, we associate happiness with pleasure, and the activity of wisdom is generally agreed to be the most pleasant of excellent activities. In any case, Aristotle claims, philosophy offers pleasures that are marvellous for their purity and permanence; so that one can expect that those who know (i.e. engage in activity) will take more pleasure than those who inquire (i.e. suffer change). Fourthly, self-sufficiency belongs more so to contemplative activity than to other human activities like acting justly, since the exercise of the virtues usually requires other people with whom we can interact. By contrast, the wise man can contemplate truth by himself, though he may benefit from dialogue with others. Fifthly, contemplation is most truly an end-in-itself because it must be loved for its own sake, as nothing arises from it apart from the activity of contemplating; whereas from practical activities we may gain more or less apart from the action. Finally, happiness is thought to
[60] depend on leisure (ἐν τῇ σχολῇ), and this is most | fitting for the activity of contemplation. By contrast, the activities of the practical virtues are exhibited in political and military affairs, but the actions associated with these seem to be unleisurely. In summary, therefore, the contemplative activity of *nous* seems to be superior in worth and to be an end-in-itself; as well as having a proper pleasure (which augments the activity) and being self-sufficient, leisurely and non-fatiguing. Since these are all attributes belonging to the blessed man (τῷ μακαρίῳ), it follows that contemplation will be the complete happiness of a man who is allowed a complete life.

But is this really possible as a life for mankind as we know it? Aristotle appears to take very seriously the objection that such a divine life would be too high for man, given that he is a mortal composite of soul and body. On the

other hand, he seems to say that man can aspire to the life of contemplation because of the divine element of *nous* in him. Thus he rejects the traditional Greek view that there is an impassable gulf between the gods and mankind, which is associated with the pessimistic advice of the poets that one should think mortal thoughts. As against this, he thinks that we must strive to make ourselves immortal (ἀθανατίζειν) by living in accordance with the best thing in us. In fact, he suggests that *nous* is what each man is himself, since it is the most authoritative and better part of him. Therefore, he concludes, the life according to intellect is the best and most pleasant life precisely because the intellect more than anything else is man. Hence this life is also the happiest.

HISTORY OF PHILOSOPHY

B. *Aristotle*

If we look at the standard commentaries on Aristotle's philosophy, we find the term 'abstraction' constantly being used to characterise his epistemology in contrast to that of Plato. Historically speaking, it may have been Aquinas[1] who was responsible for making 'abstractionism' the by-word for a kind of empiricism which holds that all knowledge derives from the senses. Indeed, the unanimity of the commentators appears to be such that it has congealed into the dogma that Aristotle's theory of knowledge is basically abstractionist in character.[2] In spite of the weight of opinion, I must confess myself to be sceptical about this dogma. Since this may appear heretical to some readers, I hasten to clarify my scepticism. I do not doubt that Aristotle opposed Plato's theory of recollection with his own claim that all of our knowledge ultimately derives from the senses. What I do question is whether Aristotle ever gives the name 'abstraction' to the process by which we grasp universals through sense experience. It is a well-known yet puzzling fact that such terminology does not appear in those few passages where Aristotle actually describes this process (*An. Post*. II, 19 and *Met*. I, 1). Now what are we to make of this fact? Perhaps one might object that this is purely a philological issue, but I am convinced that it has more general significance for the interpretation of Aristotle.

In this paper, therefore, I propose to make a fresh analysis of the terminology of 'abstraction' as it is used in the Aristotelian corpus. Significantly enough, such an analysis has not been done recently[3] in the | literature on Aristotle, presumably because the question has been taken as settled. The definitive article on this was published almost forty years ago by M.-D. Philippe (1948) who was clearly influenced by A. Mansion's reading of Aristotle (1946). For a number of reasons, I do not accept his conclusion that there are a number of different and unconnected meanings of ἀφαίρεσις strewn throughout the corpus. I will argue, by contrast, that there is a core meaning of ἀφαίρεσις which is derived from a logical technique of [14]

[1] Aquinas 1961, parags. 158, 251, 404–405, 1683, 2426, 2259–2264.

[2] See de Koninck 1957: 133–196; 1960: 53–69, 169–188. It is quite obvious that de Koninck's reading of Aristotle is heavily influenced by the commentaries of St Thomas.

[3] As far as I can ascertain, no detailed analyses have been published since the articles by de Koninck and Phillippe.

'subtraction' whose purpose is to identify the primary and proper subject of any particular attribute. By means of selected passages from the *Topics*, I will show that this technique was a standard tool in the dialectical practice of the Academy and the Lyceum. As such, it was doctrinally neutral and could be used for many different purposes. In order to establish what I claim to be the central meaning of ἀφαίρεσις (together with the correlative term πρόσθεσις), I will explain how its other uses within different contexts can be referred to this focal point for clarification. In this respect, I think, the concept of 'abstraction' in Aristotle is similar to the concept 'medical', insofar as both refer to a central activity which lends meaning to the peripheral uses of the respective terms. For instance, just as the notion of 'medical things' depends for its meaning on the focal activity of medicine, so also when Aristotle talks about τὰ ἐξ ἀφαιρέσεως λεγόμενα he is referring to the dialectical activity of 'subtraction'.

I. *A Puzzle about Terminology*

In order to place the puzzle about Aristotle's usage in its proper perspective, I will begin with a passage from the *Posterior Analytics* where the terminology of abstraction appears side by side with terms like 'induction' and 'demonstration'. Incidentally, this is a very famous passage which is often cited as evidence of Aristotle's so-called 'empiricism'. Of course, my choice of this passage is not coincidental since it supports the negative part of my thesis, i.e. that Aristotle did not have an epistemological theory of abstraction. The passage itself stands as a self-contained unit which is worth quoting in full:

> It is also clear that the loss of any one of the senses entails the loss of a corresponding portion of knowledge, and that, since we learn either by induction or
> [15] by demonstration, | this knowledge cannot be acquired. Thus demonstration develops from universals, induction from particulars; but since it is possible to familiarise the pupil with even the so-called mathematical abstractions only through induction—i.e. only because each subject genus possesses, in virtue of a determinate mathematical character, certain properties which can be treated as separate even though they do not exist in isolation—it is consequently impossible to come to grasp universals except through induction. But induction is impossible for those who have not sense-perception. For it is sense-perception alone which is adequate for grasping the particulars: they cannot be objects of scientific knowledge, because neither can universals give us knowledge of them without induction, nor can we get it through induction without sense-perception.[4]

[4] *An. Post.* I, 18, 81a38–b9, trans. Mure.

The general line of argument here is familiar to every reader of Aristotle and it is also consistent with what we find in the famous last chapter of this work (*An. Post.* II, 19). If any sense-faculty (τις αἴσθησις) has been lost, then, he insists, it is necessarily the case (ἀνάγκη) that some corresponding part of knowledge (ἐπιστήμην τινα) will also have been left out. Now the necessity of this conclusion depends on the additional premise that we learn (μανθάνομεν) either by induction or by demonstration (ἢ ἐπαγωγῇ ἢ ἀποδείξει). But in order for the general argument to hold, this premiss must have stated all the possible ways of learning, namely, induction and demonstration. These two ways are distinguished here in the following terms: demonstration proceeds from universals (ἐκ τῶν καθόλου), whereas induction proceeds from particulars (ἐκ τῶν κατὰ μέρος). Thus, keeping in mind Beta 19 of the present work, we can easily understand why Aristotle goes on to argue that demonstration depends ultimately on induction because it is impossible (ἀδύνατον) to view the universal except through induction. Furthermore, he claims, it is also impossible for us 'to be led on' (ἐπαχθῆναι) to the universal if we do not have the power of perception. Why should this be the case? Aristotle's explanation here goes through a number of steps: (a) sense-perception is only of particulars (τῶν … καθ' ἕκαστον) and (b) it is not possible to gain any scientific knowledge (τὴν ἐπιστήμην) of particulars; but (c) neither can knowledge from universals (ἐκ τῶν καθόλου) be gained without induction (ἐπαγωγῆς) nor (d) can induction be activated without sense-perception (ἄνευ τῆς αἰσθήσεως).

Now, within the context of this general line of argument, what are we to make of the parenthetical reference to abstraction? It is obvious that we cannot take abstraction to be a third mode of learning, since the whole argument depends on the claim that demonstration and induction are the | [16] only possible ways of acquiring knowledge. If one desperately wants to give abstraction an epistemological sense here, the best bet is to identify it with induction. The Greek text, however, does not support such a reading because it says that the so-called abstractions (τὰ ἐξ ἀφαιρέσεως λεγόμενα) become familiar through induction (δι' ἐπαγωγής). We can see that the grammar of this passage resists its construal as an identification of induction and abstraction. The knowing activity, on the one hand, is very clearly identified as induction whereas, on the other hand, the objects known are described in a compound nominalisation which might also be translated as 'the things said as a result of abstraction'. Furthermore, within the broader context of the argument, we find that these so-called 'abstractions' are only introduced as a limited sample of the universals which are grasped through induction. Thus, even if Aristotle should hold that there is an intellectual process called

abstraction, it would not be possible to identify it with induction on the basis of this passage. It remains to be seen whether we can construct any coherent account of his use of the terminology of abstraction.

But before we leave this passage from the *Posterior Analytics*, let us search for some pointers towards the construction of such an account. In the Oxford translation quoted above, G.R.G. Mure gives a very full and explicit rendering of the rather crabbed Greek, obviously because he is convinced that the phrase τὰ ἐξ ἀφαιρέσεως λεγόμενα refers specifically to mathematical abstractions. This conviction is shared by the majority of commentators, even though some have suspected that the phrase may have a broader reference here.[5] For the moment at least, I want to leave open the whole question of reference until we find out how to interpret the phrase itself. My initial approach to this task will consist in an attempt to discover why Aristotle can use such a phrase in an offhand manner with reference to any object of knowledge, whether mathematical or otherwise. From this point of view, let us look again at his brief elaboration upon what is known when the so-called abstractions are made familiar through induction. One can make
[17] known, he says, 'that some things belong to each kind, even if | they are not separable, insofar as each thing is such-and-such (ὅτι ὑπάρχει ἑκάστῳ γένει ἔνια, καὶ εἰ μὴ χωριστά ἐστιν, ᾗ τοιονδὶ ἕκαστον)'. The word ὅτι here has been construed as a causal particle by most translators but it might also be taken as a conjunction coming after a verb of saying or knowing, since γνώριμα ποιεῖν comes immediately before it. This is how I have construed it in my alternative translation (above) which emphasises the content of what is known. But even if we take ὅτι as a causal particle (which is more plausible syntactically), the implications for knowledge content are not significantly different. In that case the whole parenthetical passage would say that the so-called abstractions can be made familiar through induction because some of them belong to each genus, even though they are not separable, insofar as the genus is such-and-such (ᾗ τοιονδί). Thus we can see that Aristotle is simultaneously explaining *what* is known when an abstraction is grasped through induction, and *why* it can be known. In effect, what makes abstractions available to induction is that

[5] H. Tredennick (1976: 107) points out in a footnote that the term τὰ ἐξ ἀφαιρέσεως generally means 'mathematical abstractions' (he refers to *Met.* 1061a28 as an instance) but that the sense may be wider here. Jonathan Barnes (1975: 161) also seems to think that the reference is broader. By 'what are called abstractions' he takes Aristotle to mean the quasi-objects which we consider 'when we mentally abstract from ordinary objects some of their actually inseparable properties; among such quasi-objects are the objects of mathematics'. My paper shows how this is logically possible.

some of them belong to each genus of sensible objects qua (ᾗ) such-and-such or, in other words, when sensible things are taken under a certain description, e.g. as quantity. Within this context it is possible to make sense of Aristotle's additional qualification with reference to abstractions, i.e. that they are 'not separable' (μὴ χωριστά).[6] The point appears to be that, even though abstractions are not separate objects, one can still become familiar with them through induction because they belong to a perceptible aspect of sensible things. It is necessary, in fact, for abstractions to be somehow accessible to sense experience if they are going to be grasped through a process of induction that starts with sensible particulars. According to the *Categories*, such particulars are separate in the full sense and this is the reason, I think, why Aristotle enters his little caveat with regard to abstractions. Yet it may still be misleading to translate χωριστά as 'separable (from substances)', as does Apostle, who is clearly assuming that Aristotle had already solved the problem of the ontological status of mathematical objects at the time that the *Posterior Analytics* was written. Of course, this is an assumption which is never explicitly stated or defended by Apostle except under the general form of a unity-of-doctrine thesis.[7] For a number | of reasons, I think it would be difficult [18]
to defend such an assumption. First, the complete absence from the *Organon* of the concept of matter[8] makes nonsense of any suggestion that Aristotle, at this stage, held the objects of mathematics to be abstracted from matter. Secondly, the role of mathematics as a paradigm of science in the *Posterior Analytics* tends to suggest that the ontological problem about mathematical objects was just beginning to emerge for him. In any case, we are not entitled to assume that a full-fledged theory of abstraction lies behind terms like χωριστόν and ἀφαίρεσις until we know what such terms could mean for Aristotle.[9] I propose, therefore, to embark upon a brief philological excursus for the purpose of digging beneath the technical surface and exposing the mundane roots of the abstraction terminology.

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[6] Basing his argument upon a thorough search of the Aristotelian corpus, Donald Morrison claims that χωριστά always means 'separate' and never 'separable'; see Morrison 1983.

[7] This is the general assumption that clearly informs Apostle's translations and his commentaries upon the works of Aristotle (1979: ix–xiii).

[8] In spite of the absence of the term ὕλη, some scholars like Heinz Happ (1971) have argued that the concept of matter is present in Aristotle's early work. Recently, it has been shown that this claim has no grounds in the text; see Graham 1984: 37–51.

[9] It is well known that Aristotle does not make Frege's distinction between meaning and reference (*Sinn und Bedeutung*), so that I feel quite safe in treating the meaning of abstraction terminology in terms of its reference. My approach is consistent with the linguistic fact that the Greek verb 'to mean' (σημαίνειν) has a deep etymological link with pointing or referring to something.

II. *Philological Excursus*

Let us begin with a brief etymology. The noun ἀφαίρεσις is derived from the compound verb ἀφαιρέω (ἀπὸ + αἱρέω) which can mean 'to take away from' or 'to rob' or 'to deprive someone of something' (Liddell & Scott). Hence the verbal noun can be more literally translated as 'deprivation' or, in some contexts, 'subtraction'. Indeed, these are the predominant meanings of the word ἀφαίρεσις in the Platonic corpus[10] where we find the compound verb itself being used much more frequently. For instance, we sometimes find Plato using ἀφαιρῶ along with προστίθημι to convey the contrary actions of subtracting and adding (*Phd*. 95e, *Euthyd*. 296b, *Crat*. 393d, 432a; *Parm*. 131d, 158c). I can find only one passage, however, where the verb is used for the intellectual activity of separating a form and even this appears to be a non-technical usage (*Symp*. 205b4). Thus, in all of Plato's works, there appears to be no trace of any phrases like τὰ ἐξ ἀφαιρέσεως. So what is the origin of
[19] such technical phrases as we find used | by Aristotle? I think that the most promising place to look is in the *Topics*, since this is generally regarded as an early work which served as a hand-book for dialectical practice within the Academy.[11]

When we look at this work we find a number of passages where there is a pairing of ἀφαίρεσις and πρόσθεσις, and where it makes perfect sense to translate them as 'subtraction' and 'addition', respectively. This usage occurs, for instance, in the third chapter of Book III which is generally concerned with the question of what things are better and more worthy of choice than others. In the previous chapters, Aristotle has given a list of maxims or rules of procedure for deciding which of two objects of choice is preferable. For example, one rule is to compare two things with a common standard of goodness (117b10 ff., 118b1 ff.). The decision procedure 'from addition' (ἐκ τῆς προσθέσεως) is also said to make use of a common standard (τὸ κοινόν) (*Top*. 118b10 ff.). For example, one can compare two objects of choice by adding them to the same thing (τῷ αὐτῷ) in order to establish which of them makes the whole (τὸ ὅλον) more worthy of choice.[12] Another way of deciding by means of addition that something is preferable to something else is as

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[10] See Brandwood 1976; also Ast 1835/1969.

[11] See Hambruch 1904/1976.

[12] See *EN* I, 5, 1097b16–21, where the method of choosing by subtraction and addition is used with reference to the question about an object of choice (τὸ αἱρετόν). Since no explanation of the method is offered, Aristotle is obviously assuming it to be already familiar to his listeners or readers.

follows: when both are added to a lesser good, the one which makes the whole a greater good is preferable. Similarly, there is a corresponding rule of procedure 'from subtraction' (ἐκ τῆς ἀφαιρέσεως) which works in the reverse fashion: when two objects of choice are subtracted from the same thing (ἀπὸ τοῦ αὐτοῦ), the one which makes the remainder a lesser good is itself the greater good (μεῖζον) and is thus preferable. There is a curious suggestion here of some kind of analogy with arithmetical calculation, e.g. 10 - x = 2, 10 - y = 5; ergo y < x. But in spite of the linguistic connections with addition and subtraction, I do not think that this analogy can be pushed very far. Yet one can establish a far more interesting link between this terminology and the so-called 'topics about the more and the greater' (τοὺς τόπους περὶ τοῦ μᾶλλον καὶ τοῦ μείζονος).

This link emerges in a subsequent chapter (*Topics* III, 5, 119a12 ff.) which deals with the comparison of accidents in general. Aristotle says that the topics concerned with the more and the greater can be applied to this | [20]
question if the wording of the comparison is changed slightly. One might say, for instance, that whatever possesses a quality naturally (φύσει) has that quality to a greater degree (μᾶλλον) than that which does not possess it naturally. From the text of this chapter we can see that the topic of the more and the greater also uses the decision procedure of comparison with a common standard. Thus (as he says) by comparison with the same thing (τοῦ αὐτοῦ τινος), if one thing has a certain quality to a greater degree (μᾶλλον) and another thing has it to a lesser degree (ἧττον), then it is obvious that the former has it to a higher degree. We should recall that this method of comparison with a common standard is characteristic of the decision procedures by addition and subtraction. Therefore it is hardly coincidental that the topic of the more and the greater also uses such a procedure. For instance, if two things are added to the same thing (τῷ αὐτῷ) then the one which gives the whole (τὸ ὅλον) some quality in a higher degree than does the other, clearly possesses that quality to a higher degree. This is an example of the procedure 'from addition' (ἐκ τῆς προσθέσεως) and, similarly, there is a reverse procedure 'from subtraction' (ἐκ τῆς ἀφαιρέσεως). When two things are subtracted from a common standard, the one which gives the least remainder possesses the appropriate quality to a higher degree.

Let me conclude this philological excursus with a number of summary points. First, it is clear from Aristotle's *Topics* that he treats both addition and subtraction as correlative logical methods which can be used as decision procedures in different dialectical contexts (see also *Top*. 140a33 ff., 152b10 ff.). Secondly, his use of these simple procedures in many different contexts suggests that the terminology is doctrinally neutral at this stage. Thirdly,

the literal meanings of πρόσθεσις and ἀφαίρεσις link them to the so-called 'topic about the more and the greater'. Fourthly, there seems to be an integral connection between the methods of addition/subtraction and the use of a common standard of comparison or, in arithmetical terms, a common denominator. Later in the paper this connection will turn out to be useful for explaining certain linguistic peculiarities in Aristotle's usage of abstraction terminology. Finally, by showing addition/subtraction to be an integral part of the method of dialectic in the Academy, I hope to have made at least a prima-facie case for tracing the roots of the abstraction terminology to such dialectical contexts.[13]

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III. *Technical Usage*

Having examined some of the dialectical roots of the terminology of abstraction, my next tasks are to investigate both how it comes to have a narrower technical function and what other technical terms are linked with it. I will begin with an analysis of a passage from the *Posterior Analytics* (I, 5, 74a32 ff.) which appears to have very little to do with abstraction. This initial appearance possibly explains why we rarely find it cited or discussed in any of the standard accounts of Aristotle's so-called 'theory of abstraction'.[14] Yet I would claim that it is impossible to understand fully the technical terminology of abstraction without taking account of those passages where such terminology is linked with the *qua* (ᾗ) locution. In this particular passage the general context is provided by Aristotle's discussion of the different ways in which one can be mistaken in thinking that a demonstration is universal. He has already set out, in a previous section (I, 4), some very stringent conditions for necessity and universality in demonstration. One must prove, for instance, not only that an attribute belongs to every instance of a subject but also that it belongs to it primarily (πρῶτον) or in virtue of itself (καθ' αὑτό) or qua itself (ᾗ αὐτό). The example which Aristotle gives is that the isosceles triangle qua triangle is the primary subject for the attribute of having all the

[13] In his helpful editorial remarks on an earlier draft of this paper, Jonathan Barnes has objected that I am going beyond the evidence here. He correctly points out that I have only shown the terminology of abstraction to be used in dialectical contexts, not that it has its origins there. Hence I have modified my claim; but since the *Topics* is clearly an early work, I think that the use of the terminology there gives us some significant hints about its origins.

[14] See Gohlke 1914; also the section on abstraction in A. Mansion's book. However, this passage is discussed by de Koninck in his article on abstraction but not as an illustration of abstraction. The passage is also cited but not discussed in detail by Owens (1951: 381–385).

internal angles equal to two right angles. Thus, if one merely proved that this attribute belongs to every isosceles triangle, one would be mistaken in thinking that a commensurately universal[15] demonstration had been given. Therefore, for the purposes of gaining truly scientific knowledge, it is very important to have some way of deciding which is the primary subject for any given attribute. My guess is that, for Aristotle, this is one of the major functions of | the method of abstraction (or subtraction, as I prefer to call it) [22] and the textual evidence supports such a conjecture.

In the specific passage which I have in mind (*An. Post.* I, 5, 74a32 ff.), Aristotle begins by asking: when does one not know universally (οὐκ οἶδε καθόλου) and when does one know *simpliciter* (οἶδεν ἁπλῶς)? He is referring especially to the error of thinking that one has given a universal demonstration when one has proved that an equilateral triangle has its internal angles equal to two right angles. One would not be in error, he says, if 'triangle' and 'equilateral' were essentially the same in each and every instance. But this is not the case and, as a result, one's knowledge is not universal or absolute (ἁπλῶς). Therefore, with respect to any such attribute, one must always ask whether it belongs to the isosceles triangle qua (ᾗ) isosceles or qua triangle. The answer to this question will dictate to which subject it belongs primarily (ὑπάρχει πρῶτον) and then one will know what is the proper subject for a universal demonstration. But (we may ask) what method are we to use in deciding what is the primary subject of any attribute? Aristotle obviously has in mind some method of subtraction when he says that an attribute will belong to that primary subject (ὑπάρξῃ πρώτῳ) which remains after the other things are taken away (ὅταν ἀφαιρουμένων). The reference to 'subtraction' here is so brief and casual that Aristotle must be referring to some method which was well known to his audience. Fortunately for us, he gives an illustration of this method in terms of his previous example. For instance, he says, the attribute of having internal angles equal to two right angles belongs to the bronze isosceles triangle (τῷ ἰσοσκελεῖ χαλκῷ τριγώνῳ), even after the subtracting (ἀφαιρούμενος) of bronze and isosceles. Thus the attribute belongs to the whole compound thing qua triangle (ᾗ τρίγωνον) and not qua bronze or qua isosceles.

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[15] Within this context in the *Posterior Analytics*, 'commensurate universal' is the Oxford translation of τὸ καθόλου. It has the special sense of a universal attribute that belongs to every instance (κατὰ πάντος) of its proper subject, both in virtue of itself (καθ' αὐτό) and qua itself (ᾧ αὐτό). This is the type of universal needed for demonstrative science in the strictest Aristotelian sense.

Judging by the whole passage, therefore, it would appear that subtraction (or abstraction) is a logical method which allows one to intellectually isolate the primary subject of a given attribute in the following manner. One focuses upon a particular attribute (e.g. having internal angles equal to two right angles) and asks: to which aspect of a concrete sensible triangle does this attribute belong primarily? Unless one can answer this question, one cannot have strictly scientific knowledge about such triangles or, indeed, about any sensible things since these appear to us as a confused jumble of aspects (*Phys.* 184a21). The answer lies in the method of subtraction but, as illustrated in this passage, such a method also presupposes a certain order in which aspects are taken away. For instance, the bronze aspect of the sensible triangle appears to
[23] be subtracted before the | isosceles aspect. After each step in the procedure, presumably, one should stop and ask whether the attribute in question has been eliminated along with the particular aspect that has been intellectually subtracted. Attributes like weight and lightness, for example, disappear along with the bronze aspect which is thus identified as their primary subject. Similarly, the attribute of having the sum of its internal angles equal to two right angles is eliminated when one takes away the aspect of triangularity from this sensible figure. Of course, as Aristotle points out, this attribute would also disappear if one removed the aspect called 'figure' (σχῆμα) but that still does not make figure the primary subject to which the attribute belongs *per se*. This means that the order in which aspects are removed is crucially important for deciding which attributes belong primarily to which subjects. On such orderly subtraction will depend the possibility of truly scientific knowledge with reference to sensible things. In this particular illustration with the triangle, it is interesting to notice that the order of subtraction follows a successive division of descending genera into their species, i.e. figure, triangle, isosceles, bronze. Since the Academic practice of dialectic typically involved such divisions, it is clear that the method of subtraction presupposes dialectical division.

In order to test the fruitfulness of my hypothesis about the technical usage of abstraction terminology, I will now apply it to an unrelated passage in *Metaphysics* VII, 3, which also tends to be overlooked in the standard accounts of abstraction in Aristotle. The whole context for the passage is provided by the well-known discussion of the different candidates for substance (οὐσία), namely, the essence (τὸ τί ἦν εἶναι), the universal (τὸ καθόλου), the genus (γένος), and the substratum (τὸ ὑποκείμενον). Now the last of these, the subject, is defined as 'that of which the others are predicated, while it itself is not predicated of anything else' (1028b36–37: τὸ δ' ὑποκείμενόν ἐστι καθ' οὗ τὰ ἄλλα λέγεται, ἐκεῖνο δὲ αὐτὸ μηκέτι κατ' ἄλλου). It is unclear whether or

not τὰ ἄλλα refers to the other candidates for substance but it is obvious that certain characteristics of the substratum give it priority in the discussion. For instance, Aristotle seems to be justifying this order of preference when he explains that 'the primary subject is thought to be a substance in the highest degree' (1029a1–2: μάλιστα γὰρ δοκεῖ εἶναι οὐσία τὸ ὑποκείμενον πρῶτον). What we can see taking place here is a subtle shift in the meaning of τὸ ὑποκείμενον, i.e. from 'the substratum' as a candidate for substance to 'the subject' as a criterion of substance.[16] This shift has been completed a few lines later | [24] when he claims to have sketched roughly 'what a substance is' (τί ποτ' ἐστίν ἡ οὐσία), namely, that which is not predicated of another subject but that of which other things are predicated (*Met*. 1029a8–9). Now it turns out that this criterion of substantiality is inadequate by itself to single out any one of the candidates for substance. This is the case because, in a previous passage, he admitted that 'subject' can be used in at least three different senses, i.e. as matter (ἡ ὕλη), as form (ἡ μορφή), or as the compound of both (τὸ ἐκ τούτων. 1029a2–5). Furthermore, as Aristotle himself recognises, a strict application of the subject criterion would tend to identify matter with substance:

> For if this is not substance, it baffles us to say what else is. When all else is stripped off evidently nothing but matter remains. For while the rest are affections, products, and potencies of bodies, length, breadth, and depth are quantities and not substances (for a quantity is not a substance), but the substance is rather that to which these belong primarily. But when length and breadth and depth are taken away we see nothing left unless there is something that is bounded by these; so that to those who consider the question thus, matter alone must seem to be substance.[17]

I submit that the key to interpreting this rather puzzling passage is to take the concluding words οὕτω σκοπουμένοις as a reference to those who inquire into the question of substance by using the method of subtraction. If we use this as a key then the whole thing begins to make sense.

First, as I have already shown, subtraction was a well-known logical method for establishing the primary subject of any attribute. This helps to explain why Aristotle casually refers to it without any further elaboration. Secondly, it would make sense to introduce the method in a context where being a primary subject features as a leading criterion of substance. Finally, what clinches the matter for me is that the terminology of subtraction makes

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[16] For help in clarifying this distinction, I want to acknowledge the fine Ph.D. thesis of Donald Morrison.

[17] *Met*. VII, 3, 1029a11–29, trans. Ross.

its appearance in the passage. Aristotle talks first about some procedure by which all the attributes of body are 'taken off' (περιαιρουμένων) so that only matter seems to remain (ὑπομένον). This procedure seems to establish matter as the permanent substratum of all attributes and so makes it substance. At least, if this is not substance then it is difficult to see what else could be. In view of his conclusions later in Book VII, Aristotle's concessions to matter as substance must be interpreted within their dialectical context here. But clearly he considers matter to have a better claim to substantiality than the attributes of body. Since affections (πάθη) and actions (ποιήματα) and
[25] powers (δυνάμεις) are things that belong | to bodies, they are not themselves primary subjects and hence (according to the subject criterion) cannot be substances. In addition, Aristotle lists length (τὸ μῆκος) and breadth (πλάτος) and depth (βάθος) as 'some quantities' (ποσότητές τινες οὐσίαι) which are to be distinguished from substances (οὐσίαι).

At this point the standard texts contain a parenthetical explanation to the effect that a quantity is not a substance (τὸ γὰρ ποσὸν οὐκ οὐσία), which seems to suggest that he is appealing to his own *Categories* here. But such an appeal would short-circuit the whole dialectical discussion of substance in which he is engaged and, in any case, it does not fit into the argument very well. In my opinion, the crucial consideration against the substantiality of these quantities is that they belong to something else which is their primary subject. This is what I take Aristotle to mean when he goes on to say that the thing to which they belong primarily (ᾧ ὑπάρχει … πρώτῳ) has a greater claim on substance. For me it is no coincidence that immediately after this he begins to talk about 'subtracting' (ἀφαιρουμένου) length, breadth, and depth, in order to see what is remaining (ὑπολειπόμενον). As we have seen from passages in the *Topics*, this is the standard terminology of the method of subtraction which is here being used to identify the primary subject of these quantitative attributes. Of course, as Aristotle implicitly recognises in this case, the subtraction can be pushed to the extreme so that nothing appears to remain except some indefinite material substratum that is bounded by the three dimensions. When used in this way, the method of subtraction leads one to the conclusion that matter is the only substance (1029a1 8–19: ὥστε τὴν ὕλην ἀνάγκη φαίνεσθαι μόνην οὐσίαν οὕτω σκοπουμένοις). Later in *Metaphysics* VII, this extreme conclusion is rejected by Aristotle but the important point to understand, for my purposes, is that the logic of subtraction points to it. This shows the relevance to the discussion here of a method of subtraction whose main function is to identify the primary subject of any given attributes.

IV. *Abstract Objects*

The time has now come to 'save the phenomena',[18] as it were, by applying my hypothesis about the core meaning of the terminology of abstraction to those passages where such terminology seems to refer unambiguously to | mathematical objects. By way of clarification, let me repeat at this point [26] that I am not denying the fact of such references but merely offering a fresh interpretation of what it means for Aristotle to call mathematical objects 'the results of abstraction' (τά ἐξ ἀφαιρέσεως). The traditional view[19] has been that he is referring to some epistemological process of abstraction from matter, by means of which mathematical objects (along with other universals) are isolated from sensible particulars for the purposes of scientific knowledge. In my first section, I have shown that there is reason to doubt that Aristotle regarded abstraction as an epistemological process distinct from induction and deduction. Now I would like to concentrate on showing that it is the logical method of subtraction which makes these so-called 'abstract objects' available for scientific study.

I will begin with a passage from *Metaphysics* XIII, 2, which creates a stumbling-block for the traditional interpretation because it contains the only use of the terminology of abstraction in a whole treatise (XIII, 1–3) which is specifically devoted to clarifying the precise mode of being of objects. Furthermore, in this case, the terminology does not explicitly refer to mathematical objects. Now this is something of a puzzle for the traditional interpretation. If Aristotle thought that they were merely abstract objects, surely this was the place for him to say it? My guess is that to call them 'the results of abstraction' is, for him, to state part of the problem about mathematical objects rather than any definitive solution. In view of the ontological primacy given to sensible substances in *Metaphysics* VII, the status of mathematical objects inevitably becomes a pressing problem for Aristotle, especially since he does not wish to undermine the mathematical sciences. But it is very clear from his introduction to the treatise in *Met*. XIII, 1 that he is adamantly opposed to the Platonists in the Academy who posit mathematical objects as independent substances (οὐσίαι) which are

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[18] It is well accepted by now that a wide range of things come under the term 'phenomena' in Aristotle, e.g. linguistic facts as well as physical and astronomical facts. For a good discussion of this, consult Nussbaum 1982.

[19] I take the traditional view to be espoused by scholars like Gohlke, Mansion and de Koninck. In the case of the last two, the decisive influence seems to be the interpretation of Aristotle developed by St Thomas Aquinas.

either in sensible things or separated (κεχωρισμένα) from them. However, only the latter possibility is taken very seriously in *Met*. XIII, 2, even though it contains dialectical arguments against both of these possible modes of being for mathematical objects. The upshot of Aristotle's dialectical elenchus, as we might expect, is that both possibilities are rejected as inconsistent and
[27] absurd. Thus, at the end of *Met*. XIII, 2, he identifies | the issue of priority as the locus of his dispute with the Platonists who separate mathematical objects as independent substances and thereby make them prior to sensible things. Aristotle's response is as follows:

> Grant, then, that they are prior in definition. Still not all things that are prior in definition are also prior in substantiality. For those things are prior in substantiality which when separated from other things surpass them in the power of independent existence, but things are prior in definition to those whose definitions are compounded out of their definitions; and these two properties are not co-extensive. For if attributes do not exist apart from their substances (e.g. a 'mobile' or a 'pale'), pale is prior to the pale man in definition, but not in substantiality. For it cannot exist separately, but is always along with the concrete thing; and by the concrete thing I mean the pale man. Therefore it is plain that neither is the result of abstraction prior nor that which is produced by adding determinants posterior; for it is by adding a determinant to pale that we speak of the pale man. *Met*. XIII, 2, 1077b1–11, trans. Ross.

From my point of view, the most important thing to notice about this passage is the distinction which Aristotle introduces between priority in formula (τῷ λόγῳ) and priority in substance (τῇ οὐσίᾳ). The crucial significance of this distinction is that, while he concedes to the Platonists that planes and lines and points may be prior in definition to bodies, he denies that they are prior in reality. This represents, in effect, a complete reversal of the Platonic position which holds that mathematical objects are prior in reality to sensible bodies precisely because they are prior in definition.[20] Aristotle, by contrast, insists here that priority in definition and priority in substance do not always coincide in the same thing. In order to make his position clearer, he offers two fundamentally different criteria for the two kinds of priority. On the one hand, he says, those things are prior in substance which surpass others in existing separately (ὅσα χωριζόμενα τῷ εἶναι ὑπερβάλλει); whereas, on the other hand, those things are prior in definition whose accounts compound the accounts of other things (ὅσων οἱ λόγοι ἐκ τῶν λόγων). To put it more clearly,

[20] There is a passage in the *Topics* (VI, 4, 141b3–14) where the two kinds of priority are shown to coincide and where Aristotle does not appear to raise any serious objection to this coincidence of priorities, which is typical of the Platonic position.

some thing A is prior in definition to another thing B when the formula of A is part of the formula of B. The example which Aristotle gives is that one must first have a definition of 'white' before one can give a definition of the composite 'white man'. But, as he immediately points out, this does not mean that whiteness can exist separately from the white man, since attributes (τὰ πάθη) cannot exist apart from substances (παρὰ τὰς οὐσίας). He is obviously | appealing here to his own ontological categories, in order to [28]
correct what he sees to be a mistake on the part of the Platonists. But what exactly is their mistake? Putting it in Aristotle's terminology, their mistake lies in thinking that 'the thing from abstraction' (τὸ ἐξ ἀφαιρέσεως) is prior in reality to 'the thing from addition' (τὸ ἐκ προσθέσεως). Within the present context, it is clear that the Greek phrase τὸ ἐξ ἀφαιρέσεως refers to whiteness (τὸ λευκόν) and not to a specifically mathematical predicate. As far as I am concerned, this is quite consistent with the more general use of the dialectical method of subtraction which we observed in the *Topics*. In fact, the pairing of 'abstraction' and 'addition' in the present passage tends to confirm this connection, especially when Aristotle goes on to explain that it is 'from addition to white' (ἐκ προσθέσεως … τῷ λευκῷ) that the white man (ὁ λευκὸς ἄνθρωπος) is spoken about. Some commentators[21] have been puzzled by the use of the dative here, but we have already noticed in the *Topics* that this is the characteristic case for the common term to which something was added in order to make 'the whole' (τὸ ὅλον). I find this to be confirmed, in the present passage, when the white man is explicitly designated as 'the compound whole' (τὸ σύνολον) which is ontologically prior to whiteness because it is the substantial subject to this attribute. Of course, since it is not the primary or proper subject, Aristotle readily concedes that it is logically possible to subtract whiteness from the whole and to define it separately. But, for him, this does not mean that whiteness is a separate substance which is prior in reality to the white man. Obviously he thinks that the Platonists have been seduced into such an ontological claim by the fact that it is possible to define whiteness without reference to man. Thus, if Aristotle can give an alternative explanation for this logical fact, he may be able to draw its ontological teeth, as it were.

I want to claim that Aristotle's solution to this logical problem is his whole theory about attributes and their primary subjects, which I have outlined in a previous section. For instance, in this particular case, he can explain that it is

[21] Julia Annas 1976 (ad loc.). Annas thinks that Aristotle's abstractionism is psychological in character and hence is vulnerable to Frege's objections against abstraction as a psychological process. I think I have shown that this is a misunderstanding of Aristotle's terminology.

possible to separate and define whiteness apart from the composite (i.e. the white man) because 'man' is not the primary (πρῶτον) and *per se* (καθ' αὐτό) subject of colour predicates. Yet this does not mean that whiteness exists as a separate substance because it does have another primary subject, namely
[29] 'surface', to which it belongs *per se* and on which it | depends for subsistence. But, according to Aristotle's ontology, this subject itself depends on some sensible body for its subsistence. Thus, as he says in the *Physics* (II, 193b35 ff.), those who posit Ideas as independent substances are making the same kind of intellectual separation of physical forms, without being aware that such attributes are not ontologically separate from physical subjects. Indeed, as he points out, they are even less separate than mathematical attributes whose primary subjects are not physical in character. To illustrate his point, Aristotle introduces the famous example of 'the snub' (τὸ σιμόν), which is contrasted with 'the curved' (τὸ καμπύλον). The first serves as a paradigm for definition in physics because one cannot define snubness without making some reference to its primary subject, namely a nose which has a particular kind of matter (i.e. flesh). By contrast, the definition of curvature need not refer to any physical subject, even though its primary subject (the line) is ultimately dependent on sensible bodies. Hence 'the curved' provides Aristotle with his paradigm for the definition of mathematical attributes (e.g. odd and even, straight and curved) and their primary subjects (e.g. number, line, plane, and solid). As a result, he is able to say that mathematical objects in general are separated in the intellect (χωριστὰ τῇ νοήσει) from change (κινήσεως) or from physical things, without making any logical error like that of the Platonists or without committing himself to their mathematical ontology. In order to perform this philosophical tightrope act, he depends upon the 'qua' (ᾗ) locution rather than on the terminology of abstraction. If we examine *Metaphysics* XIII, 3, we will not find a single use of this terminology whereas the whole chapter is peppered with the 'qua' locution. Through careful analysis one can show that this locution performs the logical function of indicating the primary subject of whatever attributes are being
[30] considered.[22] For instance, just as certain | attributes belong *per se* to an

[22] Jonathan Lear calls this a 'qua-operator' and argues that it functions as a predicate filter, i.e. it filters out predicates which happen to be true of something but which are irrelevant to one's current concern; see Lear 1982: 161–192. The problem with this approach is that it makes the distinction between incidental and essential predicates relative to the description under which a thing is taken. Such a Quinian thesis sounds rather anachronistic when applied to Aristotle, especially since he held that the substantial essence of a thing gives one a privileged point of view from which to make the distinction. I think that my interpretation of the 'qua'

animal qua female, so also other attributes belong to a body qua solid (*Met.* 1078a5–9). By using the qua locution in this way, Aristotle goes on to give an account of the mode of being of mathematical objects without once drawing upon the terminology of abstraction. This notable fact tends to confirm my thesis that such terminology does not constitute his solution but is rather part of the problem inherited from Platonism. It remains to be seen whether this thesis will hold up in the face of passages where Aristotle clearly uses the terminology of abstraction to refer to mathematical objects. The first such passage that I want to consider is frequently quoted but rarely examined within its proper context. It comes from the third book of *De Caelo*, where Aristotle is launching into an extended critique of the *Timaeus* and its mathematical cosmology. More specifically, he objects to the composition of bodies from planes because such a theory conflicts with mathematics. Presumably, he is referring to an implication which he draws from the theory, namely that there must exist some magnitudes (e.g. lines) which are indivisible. But he insists that this is a mathematical impossibility, since it is part of the definition of continuous magnitudes that they are indefinitely divisible (*De Caelo* I, 1, 268a7 ff.). He also claims (against the Atomists) that an indivisible magnitude is a physical impossibility because the mathematical situation has certain implications for the physical situation. Now we should find this a little surprising if we assume that Aristotle always makes a sharp division between the subject-genera of mathematics and physics. Against this assumption, we should weigh carefully what he says here:

> τὰ μὲν γὰρ ἐπ' ἐκείνων ἀδύνατα συμβαίνοντα καὶ τοῖς φυσικοῖς ἀκολουθήσει, τὰ δὲ τούτοις ἐπ' ἐκείνων οὐχ ἅπαντα διὰ τὸ τὰ μὲν ἐξ ἀφαιρέσεως λέγεσθαι τὰ μαθηματικά τὰ δὲ φυσικὰ ἐκ προσθέσεως. (*De Caelo* III, 1, 299a14–18)
>
> The mathematical impossibilities will be physical impossibilities too, but this proposition cannot be simply converted, since the method of mathematics is to abstract, but of natural science to add together all determining characteristics. (Trans. W.K.C. Guthrie)

I have cited the Greek text here so that the reader can see how Guthrie over-translates the passage, presumably because he already 'knows' that the distinction between mathematics and physics is made in terms of abstraction. In the Oxford translation, J.L. Stocks also brings his own preconceptions to bear on the text when he renders it as follows:

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locution gives us a more Aristotelian way of dealing with this problem in terms of different subjects of predication and their essential attributes. This still would enable Aristotle to claim that there is one ultimate subject of predication which is a primary substance.

> For the impossible consequences which result from this view in the mathematical sphere will reproduce themselves when it is applied to physical bodies, but
> [31] there will | be difficulties in physics which are not present in mathematics; for mathematics deals with an abstract and physics with a more concrete object.

Quite clearly, this is another over-translation which is informed by a general prejudice about Aristotle's theory of abstraction. Leo Elders (1965: 275), in his commentary on this passage, says that ἀφαίρεσις denotes the process of abstraction when, for instance, the mathematician abstracts from the sensible properties of bodies so as to study extension only. Whether or not this is correct, it is clear that Elders cannot have found the whole theory in this text and he must be drawing upon all that he 'knows' from other texts about Aristotelian abstractionism. Of course, this is a natural temptation for all interpreters of Aristotle but I think that it must be resisted in this case, if we are ever to get things straight about the terminology of abstraction.

Let us therefore suppress all that we 'know' about abstraction in Aristotle and simply look at the terminology of this passage within its proper context in the third book of the *De Caelo*. Taken literally, the end of the passage merely says that mathematical objects (τὰ μαθηματικά) are spoken about (or gathered)[23] as a result of subtraction (τὰ … ἐξ ἀφαιρέσεως λέγεσθαι), whereas physical objects (τὰ φυσικά) are spoken about as a result of addition (ἐκ προσθέσεως). But it is not immediately clear how this distinction helps to explain the previous claim that mathematical difficulties will have consequences for physical things, while the reverse is not the case. Aristotle must be thinking of some continuous construction which is such that its simpler elements are successively integrated into more complex structures by addition. As a result, what is true of the simple elements in these structures is also true for the complex whole but not vice versa. The attributes of a line, for instance, will also belong to the boundary of a plane but some of the other attributes of a plane will not belong to a line. Thus the Pythagorean schema of point, line, plane, and solid, could serve as a paradigm for the sort of non-reversible relationship between physics and mathematics that Aristotle has in mind here. For example, one might say that the line is 'generated' from the point by adding one dimension (*An. Post.* 87a36–38). Similarly, if we add a new

[23] Liddell & Scott lists 'to gather' as one of the meanings of λέγειν. This meaning was picked up and developed into an elaborate theory about the role of λόγος in Greek philosophy by Martin Heidegger (1979). It is not my intention to do the same for abstraction, except to note that the 'gathering' that results from the method of subtraction could serve as a translation of Aristotle's terminology here.

dimension in each case, the plane may | be obtained from the line, and the [32]
solid from the plane, as a result of addition (ἐκ προσθέσεως).

I submit that this is the proper perspective from which to view the terminology of abstraction and addition in the above passage from *De Caelo*, since it makes better sense of the text within its own context. On this reading the passage may be taken as distinguishing between mathematical and physical predicates (τὰ λέγεσθαι), along with the proper subjects to which such predicates belong. Thus Aristotle says that mathematical objects (τὰ μαθηματικά) are spoken about as a result of subtraction (ἐξ ἀφαιρέσεως), whereas physical objects (τὰ φυσικά) are spoken about as a result of addition (ἐκ προσθέσεως). Such a reading also turns out to be consistent with the Aristotelian practice of distinguishing between the sciences in terms of their subject-genera of characteristic objects. In spite of Guthrie's translation, I can find no evidence in the passage for making the distinction between mathematics and physics depend primarily upon their respective methods. Perhaps he was misled by the evidence for a distinction between the correlative methods of subtraction and addition. But, as I have already shown, these are logical methods for finding the primary subject of any given attribute. As such they are useful for distinguishing the proper subjects of mathematical and physical predicates, respectively, yet they are not an integral part of the methodology of either science. We must be careful here not to confuse the level of actual practice with the level of logical reflection. At the practical level, Aristotle consistently distinguishes between mathematics and physics in terms of their characteristic objects. However, at the logical level, he reflects upon how it is possible, within the same concrete reality, to isolate the proper subjects of such different predicates. It is on this level that he introduces the logical methods of addition and subtraction, whose purpose is to identify the primary subject of any given attribute. We have already noticed that these methods presuppose a certain order according to which things must be added or subtracted. If this order is one of non-reversible dependency, such as is the case with the Platonic schema of priority, then the remarks in the *De Caelo* passage begin to make sense. For instance, in a subsequent passage (299a18 ff.), Aristotle says that there are many things which cannot belong to indivisibles (πολλὰ … ἃ τοῖς ἀδιαιρέτοις οὐχ … ὑπάρχειν) but which must belong to physical bodies (τοῖς … φυσικοῖς ἀναγκαῖον). It is clear from the Greek that he is talking about attributes and the different subjects to which they properly belong. By way of illustration, he says that it is impossible for any divisible attributes to belong in an indivisible subject (ἐν ἀδιαιρέτῳ … ὑπάρχειν), whereas physical attributes (τὰ πάθη) are all divisible in at least | two ways, i.e. formally (κατ' εἶδος) or [33]

accidentally (κατὰ συμβεβηκός). This could serve as an illustration of his previous claim that not all physical difficulties carry over into mathematics, even though mathematical problems do have consequences for physical things. Such a claim would seem to indicate that Aristotle is here treating physical objects as if they were 'generated', in some logical manner, from basic mathematical structures, e.g. by the addition of three dimensions. This would also suggest that he is accepting the Platonic schema of priority as the framework for this discussion in *De Caelo* and that he has not yet fully clarified the distinction between mathematics and physics in his own terms.

Let us therefore turn to a passage from the *Physics* (II, 2, 193b22 ff.) where Aristotle clearly makes such a distinction but not in terms of abstraction. Here we find that the distinction between mathematics and physics is made exclusively in terms of the characteristic objects which each scientist studies. For example, the mathematician is said to be concerned with planes (ἐπίπεδα), solids (στερεά), lines (μήκη) and points (στιγμαί). But the problem is that some of these are also aspects of physical bodies (τὰ φυσικὰ σώματα) with which the physicist is typically concerned. Hence the central difficulty raised in this passage is how to distinguish between two sciences that deal with the same concrete reality. From the point of view of my conjecture, I think it is significant that Aristotle does not propose to resolve the difficulty by saying that mathematics deals with 'abstract objects', even though he does talk about a kind of intellectual separation which makes mathematical objects available for scientific study. My suggestion is that he is talking about the logical method of subtraction which makes possible the separation of certain aspects of sensible bodies in such a way that they can serve as the primary subjects of mathematical attributes. This is why Aristotle can confidently assert that no falsity is generated by the intellectual separation of mathematical objects. If we look at the Greek text closely, I think we can find convincing linguistic evidence for the presence of the method of subtraction. First, he couches his solution in terms of the 'qua' (ᾗ) locution which can be linked with subtraction as a method of finding the primary subject of attributes. Secondly, we find him using the characteristic terminology which describes the belonging of attributes to a primary subject. For instance, he says that the mathematician is concerned with the shape of bodies but not qua limit of a physical body (οὐχ ᾗ φυσικοῦ σώματος πέρας). Nor, says Aristotle, does the mathematician consider the attributes which belong to the physical body as such (193b32–33: οὐδὲ τὰ συμβεβηκότα θεωρεῖ ᾗ τοιούτοις οὖσι συμβέβηκεν), [34] because he separates (χωρίζει) those aspects | which are already separated

in thought from change (χωριστὰ γὰρ τῇ νοήσει κινήσεώς ἐστι). Since the logical subject of mathematical attributes is not a physical substratum, the mathematician commits no error by intellectually separating them. Of course, the phrase χωριστὰ … τῇ νοήσει is itself very ambiguous because χωριστὰ can mean either 'separable' or 'separated' and τῇ νοήσει may be either an instrumental or a locative dative. Obviously, I would prefer to take the phrase as saying that the mathematical aspects of things are separated in thought because this underlines the primacy of the logical situation. There may be a point to the ambiguity, however, since correct thinking should accurately reflect the logical situation and so mathematical objects are separable by thought. But, whichever interpretation we choose, it will not give us enough room to introduce either an epistemological or a psychological theory of abstraction.

To conclude this section, let me briefly look at another passage which is often cited as evidence that Aristotle does have some such theory of abstraction. The passage occurs in *Metaphysics* XI, which book has the general character of an epitome of Aristotle's whole metaphysics.[24] As such, it tends to be condensed and obscure but the particular context for this passage is fairly clear. The whole section (XI, 3) is devoted to explaining how First Philosophy can be a single science, even though it is concerned with 'being' which has many different senses. The solution proposed is the familiar one of saying that 'being' has a focal meaning just like 'medical' or 'healthy',[25] so that the many senses of being are unified in this way. Hence, there can be a science of being without the generic unity that is usually required for a single science. There is a similar diffusion of meaning in the case of contraries (ἐναντία), yet *Met*. XI claims that it is one and the same science which deals with contraries (1061a18–19: τὰ ἐναντία πάντα τῆς αὐτῆς καὶ μιᾶς ἐπιστήμης θεωρῆσαι). This immediately leads into an extended comparison with the science of mathematics:

> As the mathematician investigates abstractions (for in his investigation he [35]
> eliminates all the sensible qualities, e.g. weight and lightness, hardness and its contrary, and also heat and cold and the other sensible contrarieties, and leaves only the quantitative and continuous, sometimes in one, sometimes

[24] Many scholars have cast doubt on the authenticity of *Met*. XI; cf. most recently Aubenque 1983: 318–344. But I am not convinced that it contains any fundamental departures from Aristotle's metaphysical position and so I will use the passage from *Met*. XI here, without putting a great deal of weight on it.

[25] G.E.L. Owen coined the phrase 'focal meaning' to capture the notion of a πρὸς ἕν equivocal; see Owen 1965.

> in two, sometimes in three dimensions, and the attributes of these *qua* quantitative and continuous, and does not consider them in any other respect, and examines the relative positions of some and the attributes of these, and the commensurability and incommensurability of others, and the ratios of others; but yet we say there is one and the same science of all these things—geometry), the same is true with regard to being.
>
> *Met.* XI, 3, 1061a28–b4, trans. Ross.

It is undeniable that this passage does contain the terminology of abstraction but its function is not so obvious as most commentators suppose it to be. H.G. Apostle (1979) translates the terminology in an instrumental sense, thereby implying that abstraction is a psychological process which produces the objects of mathematics. The translation of W.D. Ross tends to suggest a similar psychological theory of abstraction. But what the Greek says, quite literally, is that the mathematician makes his inquiry about 'the results of subtraction' (τὰ ἐξ ἀφαιρέσεως). The nominalised form here indicates that these are theoretical objects with a clear logical status already established. Thus the purpose of the parenthetical explanation of how these objects are logically separated is to explain how disparate aspects of sensible things can be unified under a single scientific perspective. It is only in this way that the unity of a mathematical discipline can serve as a model for the unity of a science of being. My thesis is that, at the level of logical reflection, it is the method of subtraction which enables Aristotle to explain the unity of each mathematical science.

If we look carefully at the text of this passage from *Met.* XI, we can find linguistic evidence for the presence of the method of subtraction. For instance, it says that when all the sensible contraries have been taken off (περιελων) the only thing remaining (καταλείπει) is quantity and continuity (τὸ ποσὸν καὶ συνεχές). By comparing this with the passage in *Met.* VII, 3 (already examined), we can find an exact parallel with the procedure of subtraction described there, even down to the language of 'remainders'. I think it is safe to assume that the so-called 'actions' (ποιήματα) and 'passions' (δυνάμεις) of bodies which are mentioned there, correspond to the sensible contraries like heavy/light, hard/soft, hot/cold, which are listed here. In *Met.* VII, 3 it is said that, after these actions and passions have been taken off
[36] (περιαιρουμένων), what remains is length | (μῆκος) and breadth (πλάτος) and depth (βάθος). Now I think it is easy to see that these 'quantities' (ποσότητες) are in exact correspondence with the continuous quantities in one, two, or three dimensions (τῶν μὲν ἐφ' ἓν τῶν δ' ἐπὶ δύο τῶν δ' ἐπὶ τρία) which here are said to remain after the sensible contraries have been subtracted. Thus, according to the account in *Met.* XI, these continuous quantities constitute

a subject-matter for the geometer who considers the attributes (τὰ πάθη) that belong to them qua quantities (ᾗ ποσά) and qua continuous (συνεχῆ) but not in any other respect. Within the science of geometry, of course, there are many different topics such as the relative positions of these quantities or their commensurability or their ratios to one another. But yet it is one and the same science of geometry that deals with all these continuous quantities and their attributes. In *Met*. XI, 3, it is clear from the context that this conclusion is crucial for the claim about the unity of First Philosophy. Thus, just as in geometry, one can consider the attributes of something insofar as it is being (καθ' ὅσον ἐστὶν ὄν), or study the opposites that belong to it qua being (ᾗ). In this case also, the 'qua' locution indicates the primary and proper subject of the attributes which are studied by First Philosophy (*Met*. IV, 1, 1003a21 ff.). This enables Aristotle to claim that it is a single science, even though there are many different senses of being and being itself is not a genus.

V. *The Epistemology of Abstraction*

Given my previous efforts to debunk the myth about an epistemological theory of abstraction in Aristotle, it may appear strange that I should finish my paper with a section having the above title. But what I have been suggesting amounts to a shift in perspective whereby the primary emphasis is placed upon the logical method of subtraction that legitimates the intellectual separation of 'abstract' objects. For scientific knowledge of these objects to be possible, of course, it goes without saying that Aristotle would consider the mind to be capable of grasping such objects and their *per se* attributes. I do want to insist, however, that he does not have either a psychological or an epistemological theory of abstraction in the sense of a fully elaborated theory of knowledge that would put abstraction on a par with induction or deduction as 'ways' to knowledge. In support of my negative thesis, I will finish with a brief analysis of three passages from *De Anima* which are often cited as evidence that Aristotle held some such theory.

The first of these passages occurs in III, 4 within the general context of a discussion of the intellective faculty of the soul. From my point of view, | [37] the crucial point that emerges from this discussion is Aristotle's claim that the intellective faculty (νοῦς) is capable of receiving all intelligible forms, just as the sensitive faculty (αἴσθησις) has the potential to receive all sensible forms. The specific context for the passage I have in mind is provided by Aristotle's distinction between a particular thing and its form or essence. For instance, the particular magnitude (τὸ μέγεθος) is different from the

essence of magnitude (τὸ μεγέθει εἶναι), just as water is different from the essence of water. He is specifically concerned with the question of whether these two distinct aspects are judged through different faculties or through the same faculty in different dispositions. This question will not arise, of course, if the distinction between a thing and its essence cannot be made. Aristotle explicitly recognises that this is the case for a number of things which he does not name (*De An*. 429b11–12). However, this is not the case for flesh (ἡ σάρξ) which cannot be without matter (ἄνευ τῆς ὕλης) and which is, therefore, a particular form in a particular matter (τόδε ἐν τῷδε), just as is the snub nose (τὸ σιμόν). Thus, according to his account, it is through the sense faculty that one judges the hot and the cold, along with the other qualities that are combined in a specific ratio to constitute flesh. But the essence of flesh is judged by some other faculty, which is either completely different from the sense faculty or related to it in the same way as a bent line is related to the same line when it is straightened (*De An*. 429b16–17). This obscure simile for the relationship between sense and intellect has been the source of interpretative nightmares for many commentators.[26] Luckily, it is not necessary for me to render this metaphorical talk completely intelligible because the context for the subsequent passage is now clear:

> Again in the case of abstract objects what is straight is analogous to what is snub-nosed; for it necessarily implies a continuum as its matter: its constitutive essence is different, if we may distinguish between straightness and what is straight: let us take it to be two-ness. It must be apprehended, therefore, by a different power or by the same power in a different state. To sum up, insofar as the realities it knows are capable of being separated from their matter, so it is also with the powers of mind. (*De An*. III, 4, 429b18–23, trans. Smith)

The Greek text is much denser and more ambiguous than the Oxford translation (above) would seem to suggest. It is undeniable, however, that the
[38] terminology of abstraction has a definite ontological sense here, which | is adequately captured in the translation as 'abstract objects'. This is confirmed by the immediate context where a comparison is being made with physical objects like 'the snub' (τὸ σιμόν). Since this is Aristotle's paradigmatic object of physics, I think it is safe to assume that 'the straight' (τὸ εὐθύ) corresponds to 'the curved' (τὸ καμπύλον), which is his paradigm for a mathematical object. Therefore, when he lists 'the straight' as being 'among the things which exist in abstraction' (τῶν ἐν ἀφαιρέσει ὄντων), we may take him to be referring

[26] One can find a good summary of the competing interpretations in the commentary by R.D. Hicks (1907/1976: 489–491).

to the realm of mathematical objects. This is conveyed grammatically by the locative dative combined with a partitive genitive, which denotes these entities.

It seems rather strange, at first, that Aristotle should distinguish between a mathematical object and its essence, just as he does for a physical object. According to the traditional interpretation,[27] mathematical objects are 'abstracted from matter' and so the distinction between particular objects and their essences is hardly applicable to them. From what I have done so far in this paper, it should be clear that I consider it inappropriate to translate the terminology of abstraction in terms of 'abstraction from matter'. In this case, if we introduce instead the logical method of subtraction, the whole point of the passage becomes much clearer. We can see, for instance, how 'the snub' and 'the straight' are different because they have different primary subjects, the one sensible and the other intelligible. But yet they are parallel concepts, since the primary subject of 'the straight' is a continuum in one dimension. It is precisely this logical fact which enables Aristotle to make the distinction between a particular straight line and its essence. However, we can find traces of the old Pythagorean schema of priority in his putative definition of the essence of straightness in terms of duality (δυάς). We should recall that, for the Pythagoreans, the number one defines (or limits) a point, while two defines a line, three defines a plane, and four defines a solid. It seems to me very likely that here Aristotle is drawing upon this tradition for his sample definition. But the main point of the passage is that, if there is a distinction between 'the straight' and its essence, these two things will be grasped by different faculties of the soul or perhaps by the same power in different dispositions. This leads to the final generalising remark in the passage, which I find to be very revealing of Aristotle's characteristic approach to epistemology.

The standard interpretation[28] of this remark is to take Aristotle as saying [39]
that, just as the realities which the mind knows are capable of being separated from matter (ὡς χωριστὰ τὰ πράγματα τῆς ὕλης), so it stands also with the powers of the mind (οὕτω καὶ τὰ περὶ τὸν νοῦν). This summary appears to fit quite well with the general topic of the chapter, namely, the separation of certain powers of the soul. However, as it stands, it is neither a relevant nor an adequate summary of this specific passage which drew a comparison between

[27] This is the tradition represented by Mansion's book and de Koninck's article, which is aptly called 'Abstraction from Matter'.

[28] Cf. Hicks' translation (133) and commentary (492–493); also Apostle 1981: 50, 154.

sensible and intelligible objects with reference to the distinction between a particular thing and its essence. In order to make the summary fit the context, we need a fresh interpretation of the received text. I propose that we take τὰ περὶ τὸν νοῦν as another way of referring to the intelligible objects which were previously called 'the things in abstraction'. Similarly, I take τὰ πράγματα as a parallel reference to objects like snub noses, which are publicly embodied in sensible matter. If one accepts this interpretation, the passage takes on quite a different look. It would say that, if there is a distinction between 'the straight' and its essence, then intelligible objects are just as little (or just as much) separated from intelligible matter as sensible objects are from sensible matter. In the case of this particular mathematical object (i.e. 'the straight'), its intelligible matter is a one-dimensional continuum. But, according to the logical method of subtraction, the primary subject of straightness is the line, which is also a one-dimensional continuum. On account of this logical fact, therefore, it is not possible for the mind to understand or define 'the straight' without reference to a line, just as it is not possible to think 'the snub' without reference to a nose. Thus, once again, the method of subtraction turns out to be the hidden clue to the meaning of this passage, since it is consistent with the object-oriented epistemology that is exemplified here. On the other hand, the putative support for an epistemological theory of abstraction dissolves in the face of contradictory claims, namely, that the mind abstracts from matter but yet mathematical objects retain a certain kind of matter, e.g. the continuum. As I have suggested, this talk about intelligible matter should be understood in terms of the method of subtraction whose logical function is to identify and isolate the primary subject of predication for any given attribute.

The second passage from *De Anima* occurs in III, 7, which is clearly a
[40] fragmented chapter and which therefore does not provide us with any | coherent context. Thus I will treat the passage simply as an isolated fragment that throws some light on Aristotle's epistemology of abstraction:

> The so-called abstract objects the mind thinks just as, if one had thought of the snub-nosed not as snub-nosed but as hollow, one would have thought of an actuality without the flesh in which it is embodied: it is thus that the mind when it is thinking the objects of mathematics thinks as separate, elements which do not exist separate. In every case the mind which is actively thinking is the object which it thinks. Whether it is possible for it while not existing separate from spatial conditions to think anything that is separate, or not, we must consider later. (*De An.* III, 7, 431b12–19, trans. Smith)

In spite of the possible corruption of the text itself, the main point of the passage is fairly clear, namely, that the mind is in a way identical with its

object of thought when it is engaged in the activity of thinking. Contrary to post-Cartesian epistemological assumptions, this means that for Aristotle the mode of being of the object dictates the manner in which the mind will grasp it. It is only from such a perspective that we can make sense of the final aporia, i.e. whether or not the mind can think anything that is completely separated (τῶν κεχωρισμένων τι), if it is not itself separated from bodily magnitude (μεγέθους). As most of the commentators remark, this aporia does not appear to be resolved in the extant works of Aristotle but still it is relevant for understanding the rest of the passage. He says, for instance, that the mind thinks the objects of mathematics (τὰ μαθηματικά) as if they were separated (ὡς κεχωρισμένα), even though they are not separated in reality. I think it is quite clear that these mathematical objects are identical with the so-called 'abstract objects' (τὰ ἐν ἀφαιρέσει λεγόμενα), which are mentioned at the beginning of the passage. In spite of the authority of the Oxford translation, I think I have established that another plausible rendering of this reference could be 'the things spoken about in subtraction'. This possible translation is supported by the prominence of the 'qua' locution in the whole passage. Since Aristotle wants to deny that mathematical objects are separate substances (οὐ κεχωρισμένα (ὄντα)), even though mathematicians treat them as if they were separate, he must give a fairly complex account of how the mind can correctly grasp such objects. Thus he says that the mind thinks the things spoken about in subtraction just as if it were to grasp the snub-nosed (τὸ σιμόν), not qua snub because that is inseparable (οὐ κεχωρισμένως) but qua concave (ᾗ κοῖλον). In other words, it is not possible for the mind to think of snubness apart from the flesh in which it is embodied because the primary subject of snubness is a nose and this is implicit in its conceptual definition. | But, since [41] it is possible to think of concavity apart from flesh, Aristotle can provide a conceptual model for how the mathematician thinks about his objects. For instance, in thinking about the snub nose qua concave, he is treating concavity as if it were separated from the sensible compound, while this is not the case in reality. Yet the mathematician is not committing any logical error because the primary subject of concavity is not this sensible compound but rather an intelligible subject (i.e. the line or the one-dimensional continuum), which is both identified and isolated by the method of subtraction. Hence it is the snub nose qua line which is concave and, under this description, it is possible to investigate its other mathematical attributes. My analysis of this passage shows, therefore, that the terminology of abstraction refers to a set of mathematical entities that are logically isolated and grasped conceptually through the method of subtraction. There is no evidence in the passage, so far as I can see, to support a psychological or an epistemological

interpretation of the terminology. For instance, if the terminology referred to a psychological production of objects, we would expect the passive participle (e.g. τὰ ἀφαιρεθέντα) to occur more frequently.[29] I think it counts strongly in favour of my thesis that Aristotle consistently refers to mathematical objects by means of this peculiar compound phrase: 'the things spoken about through (or in) subtraction' (τὰ ἐξ ἀφαιρέσεως (ἐν ἀφαιρέσει) λεγόμενα).

Finally, we come to a passage in *De Anima* III, 8 which brings us full circle, as it were, to connect the terminology of abstraction with Aristotle's general epistemology. The chapter itself is obviously meant to provide a concise summary of his previous discussion of the various faculties of the soul. For instance, in the passage we have just analysed, he claimed that the active mind is identical with things (τὰ πράγματα). In the present passage he generalises this into the claim that the mind is, in a way (πως), the whole universe of things (τὰ ὄντα ... πάντα), which consists of both sensible and intelligible things (αἰσθητὰ τὰ ὄντα ἢ νοητά). That Aristotle is here using 'is' in the sense of identity becomes quite clear when he goes on to say that knowledge (ἡ ἐπιστήμη) is, in a way, what is knowable (τὰ ἐπιστητά), whereas sense perception (ἡ αἴσθησις) is, in a similar way, what is sensible (τὰ αἰσθητά) (431b20–23). But what is even more interesting, from my point of view, is the way in which he sets about explaining this sense of identity. First, he asserts
[42] that knowledge and sensation are marked off so as | to correspond with things (εἰς τὰ πράγματα). Then he explains that potential knowledge and sensation correspond to potentialities (τὰ δυνάμει), whereas actual knowledge and sensation answer to actualities (τὰ ἐντελεχείᾳ). In other words, everything depends on the mode of being of the objects of knowledge or sensation because the faculties of the soul follow suit. Thus, we have here a perfectly clear statement of Aristotle's object-oriented epistemology which forms a sharp contrast to all post-Cartesian epistemology that makes everything depend on the existence of the mind. This contrast is important to keep in mind if we hope to understand his explanation to the effect that the intellectual and sense faculties are potentially identical with the intelligible and sensible forms (εἴδη) of their respective objects (431b24–28). It is not possible for either faculty to be identical with the concrete objects themselves because things like stones cannot be 'in the soul' (ἐν τῇ ψυχῇ). Their forms, however, can be in the soul since it is by nature 'the form of forms' (εἶδος εἰδῶν), just as the human hand is 'the tool of tools' (ὄργανον ὀργάνων). Therefore,

[29] This suggestion was made in a written comment on an earlier draft by my colleague, Prof Arthur Madigan S.J., whose helpful comments I would like to acknowledge with gratitude.

taking account of the different faculties of the soul, Aristotle declares the intellect (ὁ νοῦς) to be the form of intelligible forms, while sense perception is the form of sensible forms.

Now this discussion provides the general context for the passage on abstraction which follows hard upon the last declaration:

> Since according to common agreement there is nothing outside and separate in existence from sensible spatial magnitudes, the objects of thought are in the sensible forms, viz. both the abstract objects and all the states and affections of sensible things. Hence (1) no one can learn or understand anything in the absence of sense, and (2) when the mind is actively aware of anything it is necessarily aware of it along with an image; for images are like sensuous contents except in that they contain no matter.
>
> (*De An*. III, 8, 432a3–9, trans. Smith)

It is noteworthy that the passage begins with a general ontological claim and proceeds to draw some epistemological conclusions from it. If my previous analyses are correct, the direction of this movement may be taken as characteristic of Aristotle's whole approach to epistemology. More specifically, he argues here that all intelligible objects (τὰ νοητά) must exist in sensible forms (ἐν τοῖς εἴδεσι τοῖς αἰσθητοῖς) because it would seem (ὡς δοκεῖ) that there is nothing with independent existence apart from sensible magnitudes (οὐδὲν ἔστι παρὰ τὰ μεγέθη … τὰ αἰσθητὰ κεχωρισμένον). This is a rather puzzling argument, especially in view of Aristotle's own statement in *Met*. XII that the Prime Mover has an independent | existence apart from [43]
sensible things (1073a3–6). One suggestion[30] is that the whole passage might be dialectical in character, on account of the use of the phrase ὡς δοκεῖ. I find this rather implausible because there is so much more in the passage that reflects Aristotle's epistemological stance elsewhere. My compromise suggestion is that we take ὡς δοκεῖ to indicate an appeal to sense experience as a generally accepted criterion of existence. On this criterion, nothing appears to exist apart from sensible magnitudes (παρὰ τὰ μεγέθη αἰσθητὰ). The language here should remind us of Aristotle's critique of what he takes to be the separation of Platonic Forms. These would come under the heading of τὰ νοητά because, according to the arguments from the sciences in the *Peri Ideôn*, they are the characteristic objects of scientific knowledge. Under the same heading would come 'the things spoken about in subtraction' (τὰ ἐν ἀφαιρέσει λεγόμενα), which we have already shown to be identical with

[30] I would like to thank Arthur Madigan for this suggestion also, even though I do not find it plausible in this case.

mathematical objects. Even though these are treated as if they were separate, Aristotle would argue that they cannot have such a mode of being because it appears that nothing exists apart from sensible things.

We should also notice that he specifically indicates sensible forms rather than compound sensible things to be the bearers of intelligible forms. Within the context of this passage, there are at least two good reasons for such a move. The primary reason, I think, is that Aristotle is preparing the way for his own epistemological conclusion that it is impossible to learn or understand anything without sense perception. This claim is already familiar to us from the *Posterior Analytics* (I, 18), where Aristotle asserts that even 'the things said as a result of subtraction' (τὰ ἐξ ἀφαιρέσεως λεγόμενα) are made familiar through induction. But induction begins only when the sense faculty grasps a sensible form that contains within it many intelligible forms. This brings us to the second reason which Aristotle may have had for making sensible forms the bearers of intelligible forms, namely, that he tends to make sense perception the touchstone of reality. This shows itself in the present passage when he says that, as it seems, nothing exists apart from sensible magnitudes. Such a criterion is also consistent with what he says at *Met*. XIII, 2 when he rejects the possibility that mathematical objects might exist as separate substances (ὡς κεχωρισμένας τινὰς φύσεις. See 1077a15 ff.). For instance, he insists that the very notion of a line or a plane becoming a complete living thing 'goes beyond our senses' (ὑπὲρ … τὰς
[44] αἰσθήσεις τὰς ἡμετέρας. 1077a30). | Furthermore, nothing 'appears' (φαίνεται) to be capable of being compounded from lines or planes (1077a34–35). This comes immediately before the passage from XIII, 2 (already examined) where Aristotle concedes that mathematical objects such as lines and planes may be logically prior to sensible bodies, while denying that they are prior in substance (τῇ οὐσίᾳ πρότερα, 1077b1–2). I submit that the same ontological perspective is present in the *De Anima* passage now under consideration. Similarly, in both cases, the terminology of abstraction (or subtraction) refers to a realm of intelligible entities whose mode of being is that of dependence upon sensible substances. Of course, given Aristotle's object-oriented theory of knowledge, the ontological status of mathematical objects has definite epistemological implications. For instance, at the end of the present passage, he says that one must always theorise together with some image (ἅμα φάντασμά τι). He also goes on to explain that such mental images are like sensations (αἰσθήματα), except that they are without matter (ἄνευ ὕλη, 432a10). At this late stage in the paper, I do not propose to enter into a discussion of the complex role of images in Aristotle's psychology. I shall content myself with the conjecture that, on account of his position on

the mode of being of mathematical objects, he would probably consider it impossible to do 'pure' mathematics without the help of images. In support of such a contention, he might point to the fact that geometers typically rely on diagrams to make their objects of study more accessible. However, as Aristotle makes clear in the *Posterior Analytics* (I, 10, 77a1–3), the geometer does not draw any conclusions from the particular character of his diagrams. In other words, the philosophical geometer is aware that it is not these diagrams which are the true objects of his study but other things which are made clear through them (ἀλλὰ τὰ διὰ τούτων δηλούμενα). This mediated character of mathematical objects is quite consistent with the way Aristotle refers to them as 'the things spoken about as a result of subtraction'.

Conclusion

In this paper I have proposed a new way of understanding the terminology of abstraction, as it is used by Aristotle. At the negative level, I have shown that there is little evidence for the traditional view that he espoused either a psychological or an epistemological theory of abstraction. But, in a more positive vein, I have proposed a way in which to understand those passages which talk about the mind grasping abstract objects. What I am suggesting, in effect, is that there is a core meaning to the terminology of abstraction, | [45] namely, its reference to the logical method of subtraction. First, through selected passages from the *Topics*, I have established that this was a well-known method in the Academy and the Lyceum, which could be put to many uses in their dialectical practices. Secondly, by means of a crucial passage from the *Posterior Analytics*, I have shown how Aristotle develops the technical method of subtraction for identifying the primary subject of attributes. Since it is essential for scientific knowledge that one identify the primary subject to which the given attributes belong *per se*, the correlative methods of subtraction and addition make it possible to have particular sciences about a complex and confused sensible reality. In this light, it makes sense for Aristotle occasionally to refer to mathematical objects as 'the results of subtraction' (τὰ ἐξ ἀφαιρέσεως), in contrast with the objects of physics which are sometimes called 'the results of addition' (τὰ ἐκ προσθέσεως). Having proposed this fresh interpretation of the standard terminology of abstraction, the rest of my paper tests the accuracy and fruitfulness of my hypothesis against some of the leading passages in the Aristotelian corpus where this terminology occurs. But my hypothesis also turns out to be fruitful for elucidating a rather puzzling passage in *Met*. VII, 3, which is not usually

cited in the collection of passages for the term 'abstraction'. What this suggests is that the usual interpretation is narrowly fixated on epistemology. By contrast, my interpretation saves all the relevant phenomena, while also explaining the epistemology of abstraction.[31]

[31] I wish to acknowledge a general intellectual debt to Prof. Hans-Georg Gadamer who has been a constant source of help and encouragement for my work on Greek philosophy. Among other things, he has taught me that our modern preoccupation with epistemology can seriously mislead us in the interpretation of ancient thinkers. Therefore, throughout this paper, I have used the word 'epistemology' in the narrow and literal sense of an account about knowing, or of how the mind grasps its objects. Of course, even the term 'object' is misplaced in the Greek context because its opposite (i.e. 'subject') is not a subjective consciousness over against which it stands, as the German word *Gegenstand* implies.

Introduction

G.E.L. Owen's classic paper (1957: 103–111) on the argument from relative terms in *On Ideas* focussed attention on the reputedly Platonic arguments for the existence of Ideas that were rehearsed by Aristotle in that lost work, and subsequent papers[1] have analysed some more of these arguments. But one notices a tendency[2] to neglect the so-called arguments 'from the sciences', perhaps because of their very simplicity and because they defend the well-known Platonic view that Ideas are the objects of scientific knowledge. Such neglect may reflect the influence of Owen, who tended to emphasise the ontological interests of the early Aristotle, at the expense of his epistemological interests. What I am proposing is that we shift back to the epistemological perspective and consider Aristotle's critical reaction to these arguments as the starting-point for the development of his concept of the universal.[3]

Therefore, while treating the arguments 'from the sciences' as typically Platonic, I will use them primarily as a guide to Aristotle's own problem-situation both as an inheritor and critic of Platonism. First, I will give a brief analysis of the three arguments 'from the sciences' so as to examine the unsuitability of sensible particulars as objects of scientific knowledge and to clarify the reasons why Ideas were thought to serve that purpose. This should help us to understand why Platonic Ideas were held to be appropriate objects for established sciences like mathematics. In the second section, I will consider Aristotle's attempt to rebut these arguments without removing the foundations of such sciences by completely depriving them of their characteristic objects. I will argue that Aristotle's concept of 'the common' (τὸ

[1] Barford 1976: 198–219; Rowe 1979: 270–279; Fine 1980: 197–240.

[2] Even a careful scholar like Cherniss (1944: 226–228) has given scant attention to the arguments 'from the sciences', though a recent exception to this general trend is Frank (1984a; 1984b: 49–59) whose contributions have enabled me to shorten my analysis of these arguments.

[3] My proposal does not presuppose any developmental assumptions such as those of Jaeger 1923, since I find persuasive the argument of Gadamer 1978 that the differences between Plato and Aristotle are not as important as their shared enterprise of understanding the world through language.

κοινόν) is intended to resolve this problem in *On Ideas* but that we should not be too quick to identify this with the concept of 'the universal' (τὸ καθόλου) which is found in other texts. Finally, through analysis of comparable passages in the *Categories* and *Metaphysics*, I will sketch the conceptual development of the universal as a sort of entity that is distinguished from substantial form. I want to claim that this ontological approach to the universal reflects Aristotle's new awareness of problems about the relationship between science as universal and substance as particular. While such problems are formulated explicitly in *Met.* III and XI, his aporetic approach to philosophical inquiry dictates that we must ourselves work out the implications of passages in VII and XIII which contain his implicit solutions.

[96]

I. *The Dialectical Treatise* On Ideas

Prompted by Jaeger's influential proposal, there has been a great deal of dispute among scholars over the exact shape and direction of Aristotle's intellectual development with reference to Plato. In this paper I do not intend to enter upon these broader controversies, except insofar as they bear on the development of a single but important concept. Although it is not crucial for my thesis, I should perhaps say something about the dating of *On Ideas* because of its clear rejection of Platonic Ideas. According to Jaeger's conjecture,[4] *On Ideas* and *Metaphysics* Book I would have to have been written around the time of Plato's death in 347 BC. Düring,[5] who opposes Jaeger's evolutionary thesis, puts the writing of the work much earlier around

[4] Jaeger 1923: 172. Frank (1984a: 10) has noted correctly that Jaeger paid little attention to *On Ideas* and perhaps this means that it could not be fitted easily into his developmental hypothesis. Jaeger's index contains only two entries under the heading *On Ideas*, and in neither does he give an approximate date for that lost work. While this is noteworthy, we might hazard a guess that he would date it a little prior to *Met.* I, 9 which clearly presupposes it. Even if Aristotle were a critic of Plato's theory of Ideas much earlier than Jaeger thought, this is still compatible with the deep Platonic influences that continued to work through Aristotelian thought, e.g. the famous turn to the *logoi* as described in the *Phaedo*.

[5] See Düring 1966a: 253. Frank 1984a: 9–10 also thinks that *On Ideas* must antedate the first part of the *Parmenides* dialogue, since he is convinced that the arguments 'from the sciences' can be traced to Plato's 'pre-critical' stage as found in the *Phaedo*, *Republic*, *Symposium*, and *Timaeus*. But, especially in the case of the later dialogue, I am not convinced of this artificial division which treats the *Parmenides* as a turning point, since it depends so heavily upon a certain dogma about Plato's development, i.e. that he abandoned 'early' accounts of the relationship between Ideas and sensible things because of difficulties like the Third Man. So, according to this dogma, dialogues such as the *Timaeus* which still use the language of 'imitation' or 'participation' must have been written prior to the *Parmenides*.

365–360 BC when the great intramural debate was taking place among members of the Academy concerning the nature and function of Plato's Ideas. He believes that Aristotle's *On Ideas* must have been a significant contribution to this debate, which he finds reflected in Plato's *Parmenides*. But this would mean that Aristotle was critical of Platonism almost from the very beginning of his apprenticeship at the Academy, which is traditionally pegged at 367 BC. It would also imply that he had already rejected the theory of recollection and elaborated an alternative account of knowledge, which is highly unlikely as far as we can see from other early works.[6]

While I think it is impossible to date *On Ideas* with such accuracy, the approach I find most plausible is that of Chroust,[7] who strikes a nice balance between the extremes of Jaeger and Düring in proposing that *On Ideas* was written around 357–356 BC, as Aristotle's contribution to the critical discussion surrounding Plato's Ideas. Even though I would lean towards a later date, I think that Chroust's approximate date for the work represents a sensible compromise which does not belie the character of the extant fragments. They are critical in tone and intention, while still being parasitical on the whole Platonic framework for their meaning. There is practically nothing in these fragments that can be positively identified with characteristic Aristotelian conceptual structures.[8] In effect, judging by the evidence available, *On Ideas* seems to have been a dialectical treatise, whose purpose it was to formulate and rebut most of the typically Platonic arguments for the existence of Ideas. If that is the case then perhaps we can look to the *Topics* for help in understanding the general purpose of the work, together with the dialectical structure of particular arguments.

In *Met*. I, 9, Aristotle critically reviews the arguments of 'those who posited the Ideas'[9] as the causes (αἰτίαι) of things around us in the sensible world.

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[6] C.J. de Vogel (1965: 261–298) has given convincing arguments for the Platonic influence upon such early works as *Eudemus* and *Protrepticus*. Düring 1966b has responded to these arguments without being able to undermine their inherent plausibility. The picture of Aristotle as a radical young critic is just as implausible in its own way as Jaeger's view of him as a docile Platonist. Both views seem to neglect the possibility that the philosophical enterprise of the Academy was guided by common problems rather than by a shared dogma.

[7] Chroust 1973: 3–5. However, I do not take this dating to be so definitive as to prevent me from referring freely to Plato's 'later' dialogues by way of elucidating certain points in *On Ideas*.

[8] Unless, that is, we assume that Aristotle introduces his mature theory of universals to replace Platonic Ideas—which is precisely the assumption that I wish to question.

[9] *Met*. 990a32–b1: οἱ … τὰς ἰδέας τιθέμενοι. The use of the plural indicates that the arguments were used extensively by the Platonists, but it hardly supports the conjecture of Parente (1981: 135–152) that Xenocrates rather than Plato is the target for Aristotle's criticism.

A notable feature of this review, however, is that these arguments are not reproduced but simply mentioned by name, together with a brief critical remark. For instance, he says that 'according to the arguments from the sciences there will be Forms of all things of which there are sciences'.[10] Although the context suggests that Aristotle intends this remark to be critical, its point is not clear without the background knowledge which is provided by Alexander's commentary.[11] With reference to the above remark about the arguments from the sciences in *Met.* I, 9, Alexander comments that the sciences are used in 'many ways' (πλεοναχῶς) for the establishment of the Ideas.[12] It is not clear whether he has included all of the arguments 'from the sciences' in Aristotle's lost work, but there are certainly three distinct arguments, transcribed as follows:

(1) If every science does its work with reference to one self-identical thing, and not to any particular thing, there must be, corresponding to each science, something other than sensible things, which is eternal and is the pattern for the products of the science in question. Now that is just what the Idea is.
(2) The things of which there are sciences must exist; now the sciences are concerned with things other than particular things; for the latter are indefinite and indeterminate, while the objects of the sciences are determinate; therefore there are things other than the particulars, and these are the Ideas.
(3) If medicine is the science not of this particular instance of health. but just of health, there must be such a thing as health-itself, and if geometry is knowledge not of this equal and this commensurate, there must be an equal-itself and a commensurate-itself, and these are the Ideas.[13]

The three arguments are separated in the Greek text by the word ἔτι which characteristically marks a new point or argument, yet they also have a certain cumulative effect in their movement from the general to the particular.

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[10] *Met.* 990b11–12: κατά τε γὰρ τοὺς λόγους τοὺς ἐκ τῶν ἐπιστημῶν εἴδη ἔσται πάντων ὅσων ἐπιστῆμαί εἰσι.

[11] Alexander, *In Met.* 79.3–80.6.

[12] πρὸς τὴν τῶν ἰδέων κατασκευήν. Cf *Met.* 1034a2–4 for an exact parallel. Other parallels can be found at *EN* 1096a19, *Met.* 991b28, 1060a18, *Phys.* 216a22, *De Cael.* 293a24. We should not ignore the evidence in the *Topics* that κατασκευάζειν marks the positive or constructive side of a dialectical argument, which is incomplete without its negative or destructive aspect as indicated by the word ἀνασκευάζειν (see *Top.* 102a15 ff., 109b26 ff., 110a15 ff. and especially book 5). Thus, in order to understand the format of *On Ideas*, I think that one must look to the *Topics* as a guide to the practice of dialectical argumentation.

[13] Trans. Ross 1952: 125–126 and Greek text of Alexander, as reproduced by Ross 1955.

For instance, the first two arguments generally refer to all of the sciences, while the third argument makes specific reference to two sciences, namely medicine and geometry, which can be taken as examples of the productive and theoretical sciences, respectively.[14] The hypothetical form of the first argument serves as a perfect vehicle for specifying the conditions which an object of science must fulfil.[15] Although the first premise is part of the antecedent of a conditional, it may be paraphrased as the assertion that every science performs its own function (τὸ αὑτῆς ἔργον) while referring to some one and the same thing (πρὸς ἕν τι καὶ τὸ αὐτὸ ἐπαναφέρουσα). I think it is typical of Plato to assume that an object of knowledge must be single and self-identical (*Rep*. 339a, *Lach*. 198d–199b) and this assumption about scientific knowledge may help us to understand the second part of the antecedent which claims that science concerns itself with 'none of the particular things' (πρὸς οὐδὲν τῶν καθ' ἕκαστον). We can see from the second argument that τὰ καθ' ἕκαστα here refers to sensible things (τὰ αἰσθητὰ) which are unsuitable as scientific objects because they are both indefinite (ἄπειρα) and indeterminate (ἀόριστα).

According to the lexica,[16] τὸ καθ' ἕκαστον does not appear as a technical term in the extant Platonic corpus. Since it corresponds in structure to Aristotle's technical term for the universal, i.e. τὸ καθόλου, everything points to its being an Aristotelian coinage. But *On Ideas* represents a challenge to this conventional philological wisdom because there we find extensive use of τὸ καθ' ἕκαστον as a quasi-technical term for particulars,[17] without

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[14] By contrast with Aristotle, it seems to be characteristic of Plato not to distinguish sharply between theoretical and productive sciences, as witnessed by the prominence of the craft analogy for knowledge, especially in the early dialogues.

[15] The grammatical structure of the argument is that of a conditional whose *protasis* contains a present indicative (εἰ ποιεῖ) and whose *apodosis* has a potential optative (εἴη ἄν). This gives the whole argument the form of a weak conditional which is often used for logical inference.

[16] Ast 1835 lists a number of passages in Plato's dialogues in which the adjective is employed with the preposition to give us something that looks like a technical usage of καθ' ἕκαστον. See *Theat*. 188a, *Soph*. 217b, *Phil*. 15d, *Rep*. 487c, *Tim*. 73c, 83d, *Phdr*. 273e, *Meno* 72a. However, when we examine these passages, we find a variety of meanings for this compound adjective, καθ' ἕκαστον, all of which are loosely related to the colloquial meaning of ἕκαστος as 'each' and 'every'. Furthermore, there is no trace of the consistent nominalisation (τὸ καθ' ἕκαστον) which characterises the (later?) technical usage; see Brandwood, 1976.

[17] Frank (1984a: 22–23) argues that τὰ καθ' ἕκαστα should be translated as 'individuals' so as to preserve the systematic ambiguity of the term, i.e. as meaning either particular things or particular species. However, he leans heavily towards the second meaning in the context of the argument 'from the sciences' because he is convinced that 'both the Platonists and Aristotle are most concerned to point out that the sciences operate at a certain level of generality,

the corresponding term for universals where we should expect it according to the logic of the argument. Instead, we find Aristotle using τὰ κοινά for the objects of scientific knowledge which he insists are not Ideas. Does Aristotle invent the term for particulars in order to prepare the way for his own introduction of universals as alternatives to Platonic Ideas? If so, why doesn't he introduce τὸ καθόλου in *On Ideas* as he does in the *Posterior Analytics* (77a5–9), when the same question of alternatives to Ideas is being considered? My own hypothesis is that, when we correlate such changes in terminology with differences in his problem-situation, we can find the
[98] development in Aristotle's concept of the universal which I try to outline | in this paper.

Whatever we make of this philological problem about τὸ καθ' ἕκαστον, it seems to refer to a sensible particular in the first argument.[18] Thus the line of argument remains firm: no science performs its function with reference to any particular sensible thing, presumably because the latter does not have the characteristics of unity and self-identity which the first premise specifies as being essential for the referent of any science. Indeed, this claim about the lack of unity and self-identity in sensible things is typically Platonic, as we can see from the *Phaedo* (72a) and *Republic* (523a). It is closely related to Plato's metaphysical view that the world of sensible appearances is merely an image of the real world of Forms.[19] Thus we are not surprised when the first

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not at just any level of generality' (1984a: 20–21). Thus it appears that Frank is assuming that the distinction between universals (τὰ καθόλου) and particular species (τὰ καθ' ἕκαστα) has already been clarified by Aristotle. Against this assumption I argue that any such distinction is only developed later in different terms by way of response to a different problem.

[18] By contrast, Frank argues that it must refer to some low-level universal such as a square with sides four inches long, which is therefore disqualified as an object of geometry because it does not have the requisite generality. But he has some difficulty explaining how this can be described as a sensible thing, since what we perceive is this square with four inch sides and not the class of squares with sides of that length. Here he falls back on Aristotle's rather puzzling statement in the *Posterior Analytics* II, 19, 100a17–b2 to the effect that, even though perception is of the particular, it may have universal content. But Frank's appeal to this passage does not support his argument because there Aristotle explicitly distinguishes the particular individual (τὸ καθ' ἕκαστον), Callias, from the universal (τὸ καθόλου), man.

[19] Gadamer (1978: 11–12) suggests that the word μέθεξις may have been coined by Plato to bring out the logical connection between the Many and the One, although it leaves unclear the ontological status of the many particulars which participate in the one Form. Behind this dialectical relationship between idea and appearance, however, lurks the aporia of the whole and its parts which is so prominent in the *Parmenides* and which confronts any thinker who tries to define the relationship between unity and multiplicity. In fact, I think that this is part of the inherited set of problems which stimulated Aristotle to develop his own concept of a universal as a whole 'over' many parts, as the terminology suggests.

argument moves to the conclusion that, for each science, there should be something (eventually identified as an Idea) which is different from sensible particulars. This thing is said to be eternal and to be a paradigm for the things generated according to that science, but from the Platonic dialogues we can recognise both as familiar characteristics of Ideas (*Phd*. 79a, *Tim*. 37e5–38a6, 42a; *Rep*. 472c, 592b, 596b7–8). Although Plato does not say that the Ideas are 'alongside sensible things' (παρὰ τὰ αἰσθητὰ), the One over Many argument which is usually attributed to him may be interpreted as claiming this.[20] The fact that Aristotle's attempted rebuttal makes extensive use of the same preposition, παρά, suggests that this way of describing the relationship between sensibles and Ideas is derived from the Academy. Yet we should note that the first argument 'from the sciences' simply claims that an Idea is something 'other' (τι ἄλλο) besides sensible things. While this reminds us of the χωρισμός of Ideas, which Aristotle stresses so much in his criticism,[21] I think that his rebuttal here makes more sense when interpreted epistemologically.

Let us briefly consider the second argument 'from the sciences' whose categorical tone is set by the indicative mood of all its verbs.[22] Despite the impression given by Ross's translation of the first premise, there is no modal qualifier governing the syntactically absolute use of εἶναι which itself is not necessarily existential. As Kahn[23] has shown, there are many cases in classical Greek where such a use of the verb 'to be' does not have the sense of 'existence', and the syntactical structure of the first premise does not seem to conform to any of the usual existential constructions in Greek. While one might claim that the pronominal adjective ταῦτα serves as the subject of ἔστιν in the

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[20] In spite of Aristotle's report, Fine (1980: 197) claims to the contrary that Plato never uses the One over Many argument to prove the existence of separated Forms. This leads her to give a rather implausible interpretation of *Republic* 596a where the One over Many assumption is conjoined with the positing of separated Forms corresponding to what she calls '(ND) predicates'. An indication of this implausibility may be found in Fine's accusation that Plato is here indiscriminately pulling together two quite different arguments and assumptions to reach the unjustified conclusion that there are separated Forms.

[21] See Fine 1984: 31–87. In fact, as Gadamer (1978: 14–15) has pointed out, Aristotle's critique of Plato's χωρισμός makes more sense if it is formulated not in ontological but rather in epistemological terms with reference to the mathematical sciences. But this does not mean that it should be taken in any subjective way, since the most fundamental assumption of Plato is that some objective reality corresponds to this 'pure' mode of knowing.

[22] Frank (1984a: 49) notes that, unlike the other two arguments, this second argument can easily be reconstructed as a syllogism which is valid in the third figure, i.e. 'Darapti' in medieval logic.

[23] See Kahn 1973. It should be noted, however, that Kahn's scruples about the use of the existential εἶναι are not shared by many scholars, especially for later Greek.

final clause of the premise,[24] this construal ignores the peculiar syntax of the whole premise which reads: ὧν ἐπιστῆμαί εἰσι, ταῦτα ἔστιν. Indeed, this syntax reminds one of the veridical construction which typically has a first clause with a verb of saying or knowing, together with a second clause asserting that what is said or known is indeed the case. For this the characteristic assertions are ἔστι ταῦτα and ἔστιν οὕτω, both of which also occur as standard forms of assent in Plato's dialogues. Hence, in the veridical construction, the verb εἶναι means 'it is (the case), just as one says or thinks it to be'. The logical function of the verb in its veridical use is to assert a semantic relation between language and the world.[25]

Now, I think that a resourceful grammarian can find analogies between the first premise and the standard veridical construction. For instance, one could argue that the deep structure of the first clause involves a verb of knowing (ἐπίσταμαι) which is nominalised in the surface structure as 'the sciences' (ἐπιστῆμαι). Thus one might paraphrase the first premise as follows: 'the
[99] things that are known, these are (true)'. | In fact, as Kahn (1976: 323–334) has pointed out, such ambiguity between the truth of statements and the real existence of things is characteristic of the Greek discussion of 'being'. He might have added that it is especially characteristic of Plato to assume that the truth of the sciences demands objects with a special mode of being. This is reflected in his virtual equation of what is completely intelligible (παντελῶς γνωστόν) with what is completely real (παντελῶς ὄν, *Rep*. 477a).[26] Indeed, his general distinction between 'that which always is' (τὸ ὄν ἀεί) and 'that which is always becoming' (τὸ γιγνόμενον ἀεί) is consistently based on the claim that the first is grasped only by intelligence, while the latter is an object of sense perception (*Rep*. 510b, *Tim*. 27d–28a). Thus, rather than making an existence

[24] One anonymous reviewer thinks that ταῦτα must surely refer to the things about which we have knowledge, since s/he is convinced that the veridical use of εἶναι makes no sense in this context. Another reviewer claims that for this use to be plausible here one would have to show that the verb of knowing, which is hidden in the first clause, takes a sentence rather than a noun phrase as object. In spite of these objections, however, I think my reading fits better with the peculiar syntax of the first premise.

[25] It might appear to our modern logical sensibilities that the veridical reading is only plausible when the 'objects' of science are treated as states of affairs which are expressed in propositions. But, although Platonic Forms are neither propositions nor states of affairs, we should not rule out the possibility that they combine the functions of both as paradigmatic objects that guarantee the truth of our knowledge.

[26] Vlastos 1965a: 1–19; 1966: 5–19 also seems to favour the veridical over the existential sense of εἶναι in his interpretation of such phrases in Plato, since the claim that Forms have greater reality than sensible things makes more sense from an epistemological point of view.

claim, the first premise of the second argument asserts that the things known by the sciences are intelligible and true and, hence, 'really real' (ὄντως ὄν).

From this perspective we can now elucidate the lemma which yields the intermediate conclusion that the sciences are about 'other things beside particulars' (ἄλλων ... τινων παρὰ τὰ καθ' ἕκαστα). In the lemma we find this conclusion being justified and explained by the further claims that the particulars in question are indefinite (ἄπειρα) and indeterminate (ἀόριστα) but that the sciences are about determinate things (ὡρισμένων). If we accept that τὰ καθ' ἕκαστα refers to sensible particulars,[27] then we can make sense of this whole lemma from the Platonic perspective. Sensible things are subject to change of all kinds and thus are not suitable as objects of knowledge because they are never 'really real'. Hence, for instance, the account of the sensible world that is given at *Timaeus* 29d is said to be 'a likely story' (τὸν εἰκότα μῦθον), as distinct from the truth (ἀλήθεια). Similarly, in the *Republic* (529a), Plato criticises the contemporary practice of astronomy on account of its exclusive attention to the sensible things in the heavens, and insists that the philosophical astronomer must seek the truth (τὴν ἀλήθειαν) through reason and thought rather than through the senses. In such passages Plato uses 'truth' as a synonym for 'reality' or for what is 'really real' (see *Philebus* 59c). By keeping these passages in mind, we can understand the meaning of the alpha-privative terms which are used to describe sensible particulars in the first part of the lemma.

The first of these terms indicates an absence of limit (πέρας) to be characteristic of particulars which are thereby rendered defective in some manner as objects of knowledge.[28] An important historical clue to the nature of this defect may be found in the reputedly Pythagorean[29] table of opposites

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[27] If one takes it to refer to particular kinds of object (e.g. squares with sides of a definite length), as Frank (1984a: 49) does, then it is more difficult to explain why such things are characterised as indefinite and indeterminate, though it is still possible with some ingenuity. Another possibility is to assume that particular sensible properties are in question and that they are indeterminate because of the relationships which they bear to other sensible properties; see Nehamas 1975b: 105–117.

[28] Ultimately, I think, it is part of the Parmenidean heritage to make πέρας an essential condition for an object of knowledge. The epistemological orientation of Parmenides is attested by Aristotle *De Caelo* 298b22–25, who claims that his predecessor mistakenly projected the conditions for knowledge on to sensible things. But, as Klein (1968: 49) argues, it is likely that the One/Many problem first arose within the Pythagorean tradition in connection with the unity of number as a multiplicity of units.

[29] The difficulty of establishing precisely what can be attributed to Pythagoras is brought out clearly by Burkert (1962), who still manages to throw some light on how the tradition influenced Plato. However, we do have some extant fragments of Philolaus (Frgs. 3 and 4) which claim that there will not be anything which will be known (τὸ γνωσούμενον) if all things

which Aristotle lists at *Met*. I, 5, 986a23. At the head of this table we find πέρας and ἄπειρον on the 'good' and 'bad' sides, respectively. Further down, we find ἕν and πλῆθος listed in a corresponding fashion which provides us with a numerical interpretation of ἄπειρον, though a qualitative reading may also be possible.[30] What motivates such a tabulation is the characteristic Pythagorean view that limit is a good to be sought in all things, while the unlimited (or indefinite) is something bad to be avoided. Now this should also guide our interpretation of the second alpha-privative term used to describe particulars, namely, ἀόριστα. This is derived from the verb ὁρίζειν which literally means to mark out a boundary (ὅρος) or to place a limit around something. Of course, we should not forget that this verb also means 'to define', since this provides us with a linguistic clue to the reasons why sensible particulars are considered unsuitable as objects of scientific knowledge.[31]
[100] For both Plato and Aristotle, in their respective ways, the possibility | of such knowledge depends ultimately on definition (ὁρισμός). But, if sensible particulars are unbounded or indefinite in crucial respects, then they will be indefinable and hence unknowable. We can spy here the seeds of a problem for Aristotle's ontology of particulars and its relationship to scientific knowledge.

But Plato need not consider any such problem because for him there is no gap between what is completely intelligible and what is really real. In fact, since he does not use τὰ καθ' ἕκαστα in any technical way, we might doubt whether he acknowledged sensible particulars to be entities such as Aristotle's argument presupposes. If they are referred to by Plato as τὰ μετέχοντα (*Parm*. 130b), we may suspect that he regarded them as

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are unlimited (ἀπείρων) and hence that all known things have number (ἀριθμόν), since this is an essential condition for anything to be thought or known. These fragments tend to support my quantitative interpretation of the indeterminacy of sensible particulars.

[30] Frank (1984a: 51–52) thinks that qualitative indeterminacy is the more viable interpretation, since it fits what he calls the 'distributive' and the 'inclusive' reading of τὰ καθ' ἕκαστα, i.e. whether we take it to apply to each member of the class or to the whole class as such. But it is noteworthy that when he rules out quantitative indeterminacy as an attribute of a single subject, he assumes that he has proved already that τὰ καθ' ἕκαστα must refer to low-level types or kinds rather than to sensible particulars. Yet it seems to me that the epithets 'indefinite' and 'indeterminate' are more appropriate to the latter, as even the passages he cites from Aristotle appear to show, see *Met*. 1037a24–27, 1039b27–1040a2, and 1049a36–b2.

[31] In a fragment from the *Protrepticus*, Aristotle enunciates the typical Platonic claim that science is about definite (ὡρισμένων) and ordered (τεταγμένων) things rather than of things with the opposite characteristics (see Iambl. *Protr*. 6, 37.30 ff. Pistelli). This is reflected by the theoretical science of arithmetic, for instance, in the definition of number given by Aristotle *Met*. 1020a13 (πλῆθος … πεπερασμένον) or in that attributed to Eudoxus, i.e. 'A number is a finite multitude', Iamblichus, *In Nicom*. 10.17: ἀριθμός ἐστιν πλῆθος ὡρισμένον.

deriving their being only by participation in the Forms. In a passage from the *Parmenides* (129b–d), Socrates declares that one should not be surprised if such particulars (e.g. sticks and stones) can be shown to be simultaneously one and many (ἕν καὶ πολλὰ),[32] since this only proves that 'something' (τι) partakes of both unity and plurality. I think we can interpret this declaration as evidence that Plato considered sensible particulars to have an indefinite number of aspects and, hence, to be unknowable as such. There is further evidence to be found in the *Philebus* (14c11–e4) where the one-many problem at the level of sensible particulars is dismissed as commonplace and uninteresting because for Plato the real problem occurs at the eidetic level, especially with reference to how a Form number can be a unity, while also being a plurality of noetic units.

But the most crucial piece of evidence supplied by the *Philebus* passage concerns the way in which the two different levels are distinguished. On the one hand, the One (τὸ ἕν) which so easily appears to be many belongs 'among those things that come into being and perish' (15a: τῶν γιγνομένων τε καὶ ἀπολλυμένων). Whereas, on the other hand, it is difficult to conceive as many those units (μονάδας),[33] 'each of which is always one and the same and is subject neither to generation nor destruction' (15b: μίαν ἑκάστην οὖσαν ἀεί τὴν αὐτὴν καὶ μήτε γένεσιν μήτε ὄλεθρον προσδεχομένην). Here Plato appears to be distinguishing between Forms and perishable particulars when he talks about the problem of how a single Form can appear 'in the indefinite number of things that come into being' (15b5: ἐν τοῖς γιγνομένοις αὖ καὶ ἀπείροις).[34] This appears to be another version of the problem of participation which in the *Parmenides* (129–135) is associated with a sharp distinction between the Forms and the things which participate in them. What is noteworthy about the *Philebus* passage (15b–c), however, is that Plato there clearly characterises the perishable things as being indefinite in number (ἀπείροις) by contrast

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[32] Frank (1984a: 18) argues that the most plausible Platonic antecedent to τὰ καθ' ἕκαστα is τὰ πολλὰ which is familiar from the early and middle dialogues. In addition, he takes ἕν/πολλὰ to be a distinction between universals of greater and less generality, although he admits that πολλὰ refers to sensible particulars at *Parmenides* 129a2–3.

[33] It would appear from the context and from the illustrations that the 'monads' are Forms such as Man, Ox, Beauty and Good (see *Phil.* 15a3–5), but the language suggests a parallel with the noetic units in a Form number. This parallel prepares the way for Plato's subsequent solution which depends heavily on the analogy between knowing and counting.

[34] Arthur Madigan (1994: 8) has shown convincingly how Plato uses *hyperbaton* (displacement of the natural order of words) in this passage to interweave two distinct problems about how the unified monad can be involved in plurality and how a changeless monad can be involved in becoming. I am grateful to my colleague for allowing me to read many of his unpublished writings which I have found enormously helpful.

with the definite unity and self-identity of the Forms. The clear implication of the passage is that knowledge of an indefinite number of particulars is impossible. This implication comes out a little later in the dialogue (16c–e), when numbering is introduced as being essential for all learning and teaching. There it is said that the sophists destroy the possibility of knowledge by jumping immediately from the One (τὸ ἕν) to the indefinite (τὸ ἄπειρον), without ascertaining just how many (ὁπόσα) Forms are intermediate between the two.

Such numerical determinacy may thus be involved in the lemma of the second argument which states that the objects of the sciences are determinate (ὡρισμένων). Of course, we should not forget the derivation of the word from ὁρίζειν, which makes for a sharp contrast with ἀόριστα in the Greek. Thus we can paraphrase the whole lemma as follows: the sciences are about different things besides sensible particulars | because these particulars [101] are unlimited in number and indefinable, whereas the objects of the sciences must be definable. Therefore, since it explicitly assumes that the sciences are true, the argument legitimately reaches the initial conclusion 'that there are some things besides particulars' (ἔστιν … τινὰ παρὰ τὰ καθ' ἕκαστα). But it is clear from the Greek that there is a distinct last step which asserts that 'these (things) are Ideas' (ταῦτα δὲ αἱ ἰδέαι). Thus, with an eye to Aristotle's critique, one might conjecture that this persistent distinguishing of the final conclusion as a separate step in each argument represents his own contribution to the formulation.

Finally, let us turn to the third argument 'from the sciences', which consists of two sub-arguments sharing the grammatical form of a general conditional whose *protasis* covers the first two premises and whose *apodosis* is equivalent to the intermediate conclusion in each case. So, just as in the previous arguments, the final conclusion involves an additional step. In effect, this third argument represents an application of the general argument 'from the sciences' to two branches of knowledge, namely, medicine and geometry. Thus our main task is to understand the meaning of the epithet ἁπλῶς which is used to characterise the real objects of such sciences.[35] A vital clue to this

[35] An anonymous reviewer has pointed out that ἁπλῶς is an adverb and so must characterise the knowing relation between the science and its object, rather than the object itself. While this is true in a strict grammatical sense, I think there are many passages in Plato and Aristotle where the epithet is applied (perhaps by transference) exclusively to a noun term, which does not have any deep verbal structure associated with knowing; see Ast 1835, Brandwood 1976 and Bonitz 1870. In this third argument from the sciences, I think that one must take ἁπλῶς as characterising the mode of being of the scientific object by contrast with that of the particular things that are rejected as such objects. This might be described as the projection

meaning can be found in the Greek text where these objects are contrasted with the particular instances that are rejected as unsuitable objects for the respective sciences. For instance, the argument asserts that medicine is not the science of this instance of health (τῆσδε τῆς ὑγιείας) nor is geometry the science of this instance of equality (τοῦδε τοῦ ἴσου). Presumably, this means that neither science is concerned with the particular instance *as such*.[36] The general reasons why this is so have already been elucidated in connection with the second argument 'from the sciences', which claims that particulars are both indefinite and indeterminate. However, apart from these general reasons, there may also be special reasons why the science of geometry cannot be about particular instances of equality or commensurability. I think that it is these special reasons which give us the real clue to the meaning of ἁπλῶς, But, in order to clarify these reasons, we must take a brief look at another argument for the existence of Ideas in *On Ideas*, namely, the argument 'from relatives'.

I do not wish to enter into the controversy[37] about the structure and interpretation of this complex argument, except to say that I am convinced by Barford's elegant solution to previous difficulties about an apparent contradiction between its first and second sections. Furthermore, in order to understand the meaning of ἁπλῶς, I will focus exclusively on the reasons why 'equal itself' cannot be predicated non-homonymously of sensible particulars. Thus, I will begin by simply quoting the second section of the argument, as translated by Barford:

B. We predicate 'equal' in the strict sense (τὸ ἴσον αὐτό) of things in this world, being predicated of them homonymously (ὁμωνύμως). For
   1. the same definition does not fit them all,
   2. nor are we indicating things that are really equal, since the sizes of sensibles are continually changing, and they are not determinate, and
   3. neither is there anything in this world which answers without | qualification [102] (ἀκριβῶς) to the definition of the equal. But

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of a mode of cognition upon its characteristic objects, although Plato would probably say that the mode of being of such objects determines the corresponding epistemological state of the soul; cf. *Rep*. 477a–c, *Tim*. 27a–b.

[36] Frank (1984a: 67) takes the referents to be particular kinds of health and particular kinds of equality, just as for the previous arguments he interpreted τὰ καθ' ἕκαστα as referring to low-level universals rather than to concrete particulars. But if he accepts (as he seems to do) this nominalisation as being equivalent in meaning to τῆσδε τῆς ὑγιείας or τοῦδε τοῦ ἴσου, his interpretation runs into difficulties because he can hardly deny the concrete particularity of these latter phrases with their implicit dependence on pointing rather than on speech.

[37] See Cherniss 1944: 279–284, Owen 1957: 103–111, Barford 1976: 192–219, and Rowe 1979: 270–279.

4. not even [do we call them equal non-homonymously] on the grounds that one of them is the paradigm and the other an image, for the one is no more paradigm or image than the other. And
5. even if someone were to claim that the image is not homonymous (μὴ ὁμωνύμως) with the paradigm, it always follows that these equal things are equal as images of what is truly and strictly equal.[38]

The first section of the argument 'from relatives' already has outlined three different ways in which the same thing (e.g. 'man') can be predicated of several different things non-homonymously (μὴ ὁμωνύμως). So the second section tries to show why the predication of 'equal itself' of 'things in this world' (τῶν ἐνταῦθα) does not belong to any of these non-homonymous ways. The first reason (B1) given is that the same λόγος does not fit all the sensible things in this world that are called equal. This has the appearance of being an implicit appeal to the criterion of homonymy which is found in the *Categories* (1a1–2), namely, that things are called homonymous when they have only a name in common but have a different definition (λόγος) of their being.

It should be noted, however, that the Platonic meaning of 'homonymy' is significantly different, i.e. particular instantiations 'share the same name' as the Form and they also participate in the common nature by virtue of which they are called that name. Hence, if the above argument is to remain consistently Platonic in character, I think we must accept Barford's suggestion that the latter sense of 'homonymy' be given precedence over the Aristotelian meaning. This should be understood by contrast with non-homonymous predication which is set out in the first section of the argument and which is governed by the logical principle that when we predicate the same thing of several individuals, we are indicating one and the same nature (μίαν τινὰ φύσιν) in all cases. Hence the second section begins with the claim that 'equal itself' is predicated homonymously of things in the sensible world because the same account cannot be given for different kinds of sensible equals. For instance, equal distances and equal weights would have to be defined in terms of different standards and even the standard measures themselves would be given different definitions. So there is not some unique nature in all sensible equals to which one might be referring when one predicates 'equal' of them and, for this reason, 'equal itself' is predicated homonymously of things in this world.

[38] Alexander, *In Met.* 83.6–11, trans. Barford 1976: 193.

The second reason given as to why we are speaking homonymously when we predicate 'equal itself' of sensible things is that we are not referring to things which are 'truly' (ἀληθῶς) equal. The explanation given is that quantity in sensible things (τὸ ποσὸν ἐν τοῖς αἰσθητοῖς) is changing and fluctuating continually (κινεῖται … μεταβάλλει συνεχῶς) and, hence, is non-determinate (ἀφωρισμένον). Such a description of sensible quantity as indeterminate should remind us of the second argument 'from the sciences' where sensible particulars are described as indefinite and indeterminate (ἀόριστα). Hence, the so-called 'flux argument'[39] may also be implicit in this description of particulars, even though it is specifically linked to quantity in the argument 'from relatives'. I think this may give us a different way of understanding the third reason (B3) than that which Owen's translation (which is accepted by Barford on this point) suggests. His translation of ἀκριβῶς as 'without qualification' is clearly | motivated by his thesis that the argument 'from rela- [103]
tives' depends entirely on the distinction between complete and incomplete predicates. The former are καθ' αὑτό predicates like 'man' which can be predicated non-homonymously of things in the sensible world because individual men are 'strictly' (κυρίως) what they are called, whereas the latter are πρός τι predicates like 'large' which cannot be predicated of sensible things without some specification of aspect.

According to Owen, the Platonic list of incomplete predicates includes not only relative terms like 'equal' but also concealed comparatives like 'beautiful', together with mathematical predicates of number and measure. Furthermore, he believes that the flux argument would undercut the distinction between complete and incomplete predicates because it asserts that all sensible things are in flux, thereby implying that all predicates are incomplete in their application to the sensible world.[40] However, he fails to notice that

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[39] According to Aristotle's account in *Met*. I, 6, 987a32–35, Plato was convinced by the argument of Heraclitus that 'all sensible things are always in a state of flux and that no science of them exists' (987a34–35: ὡς ἁπάντων τῶν αἰσθητῶν ἀεὶ ῥεόντων καὶ ἐπιστήμης περὶ αὐτῶν οὐχ οὔσης). Therefore Plato sought the objects of Socratic definition in a realm of Ideas besides (παρά) sensibles 'because it is impossible for there to be some common definition of sensible things which are always changing' (987b6–7: ἀδύνατον γὰρ εἶναι τὸν κοινὸν ὅρον τῶν αἰσθητῶν τινός, ἀεί γε μεταβαλλόντων). This doxographical account confirms something that is implicit in the text of *On Ideas*, namely, the interpenetration of three arguments for the existence of Ideas: the flux argument, the argument 'from the sciences', and the argument 'from relatives'.

[40] A great deal depends on how one interprets the flux argument as applying to sensible things, even if one accepts Aristotle's report that it was an important argument for Plato's postulation of separated Forms. Irwin (1977: 1–13) claims that two distinct kinds of change (s-change and a-change) are conflated by Plato and Aristotle in their reports of Heraclitean flux as being associated with sensible things. The accuracy of this claim has been questioned

the second part of the argument from relative terms confines its attention to quantity in sensible things when it speaks about continual change and fluctuation. Thus the reference to flux does not necessarily undercut the first part of the argument which uses the examples of man and his image to illustrate the point. If a man changes size or shape, he is no less a man than before, but if one triangle changes in this way it will usually cease to be exactly equal to another triangle. Indeed, as Plato often insists in both the *Republic* and the *Timaeus*, we should not expect mathematical precision in the sensible world. Hence we can retranslate the third reason (B3) as follows: 'nor is there any of the things in this world which precisely (ἀκριβῶς) conforms to the definition of equality'. In order to qualify as what is strictly equal itself (αὐτόισον καὶ κυρίως), some sensible standard would have to present only a single aspect and be completely unchanging in every way, along with being the unique paradigm because of which all other sensible equals are so called. But this possibility is ruled out by the ontological gap between Being and Becoming which is evidenced by the claim that sensible quantities are fluctuating continually.[41]

Perhaps this throws some light on the argument from the science of geometry which asserts that it is a science not of this instance of equality (τοῦδε τοῦ ἴσου) but of equality simpliciter (ἁπλῶς ἴσου). The use of the demonstrative pronominal adjective, ὅδε, implies that one can point to the particular instance of equality in question, perhaps even a visible standard of equality. This is indirectly confirmed by the section (B2) of the argument 'from relatives' which asserts that 'we are not pointing to truly equal things' (οὔτε τὰ ἀληθῶς ἴσα σημαίνομεν) when we predicate 'the equal itself' (τὸ ἴσον αὐτό) of things in this world (ἐνταῦθα). Hence, it is only of equality itself that we can say it is equal without qualification (ἁπλῶς), both in the sense that we do not have to specify in what respect things are equal and in the sense that this equality does not change or fluctuate. In the case of geometry, this seems to call for an ideal standard or paradigm of equality which might be thought to involve at least a pair of things that were exactly and unchangingly equal.[42]

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by Kahn (1986: 241–258). Indirect support for linking the arguments from the sciences and from flux may be found in the *Theaetetus* (160d–e) which shows the Protagorean claim that perception is knowledge is dependent on a Heraclitean ontology.

[41] See Bolton 1975: 66–95. In order to avoid the paradoxes arising out of self-predication for the Form, Prior (1985: 17–20) distinguishes between abstract standards (like the wave-length of krypton-86) which he calls 'patterns' and 'concrete exemplars' like the standard metre-bar in Paris. This distinction could be applied here to show why no sensible standard can qualify as a Form because of its diminished ontological status.

[42] Geach (1956) appeals to the authority of Wittgenstein to back his claim that the Form

But the conclusion of the argument from the science of geometry states that there must be 'some equal-itself' (τι αὐτόισον) which is among the objects of the science. The apparent conflict between singular and plural can also be found in Plato's references to the paradigm of equality (cf. *Phd* 72–75).[43] But we never find him characterising the Idea of Equality by means of the compound αὐτόισον, which may be Aristotle's own invention. Thus there is good reason for us to hesitate over the last step in the final argument which concludes that | the referents of such compounds as αὐτοϋγίεια, αὐτόισον and [104] αὐτοσύμμετρον are Platonic Ideas. When we compare this with the passage cited from the *Phaedo*, we find the Idea of Equality referred to as αὐτό τό ἴσον and as αὐτὰ τὰ ἴσα but never as αὐτόισον. This might lead one to suspect that Aristotle is already preparing the way in this formulation for his later rebuttal. For instance, the use of the compound words to refer to Ideas could be seen as a preamble to his favourite objection, namely, that Ideas are no more than eternal particulars.[44] But since no such objection appears in his rebuttal here, I would conjecture that Aristotle simply follows the usage of the Academy and that he is not here concerned with the ontological issues which are raised in the *Metaphysics*.

II. *Aristotle's Response to the Arguments 'from the Sciences'*

According to Alexander's report, Aristotle's general response began as follows:

> Such arguments do not prove the point at issue, that there are Ideas, but they do show that there are things other than sensible particulars. It does not follow,

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of Equality, if conceived of as a standard, would naturally consist of a pair of absolutely equal things. But I think that this conclusion may perhaps be avoided by appealing to Prior's distinction between abstract standards and concrete exemplars.

[43] See Brown 1972: 24–36. Plato's use of the plural (i.e. 'equals themselves') might be explained away as an ordinary attraction in Greek of cases and numbers to previous contexts; see Denniston 1952: 38.

[44] Aristotle is very fond of the objection that Ideas are nothing but eternal sensibles (αἰσθητὰ ἀΐδια); see *Met.* 997b6–12, 1040b30–34, 1060a16–18, 1086b10–11. In one of these passages he accuses the Platonists of simply adding the word αὐτό to sensible things, thereby producing such peculiar entities as 'Man-himself' (αὐτοάνθρωπον) and 'Horse-itself' (αὐτόϊππον); see *Met.* 1040b30–34. While the occurrence of the familiar compound within an elenctic context might arouse our suspicions, Aristotle does appear to adopt such usage from the Platonists. Thus his favourite objection appears to rest on forcing upon the relationship between Forms and particulars the following harsh dichotomy: either they are called the same name non-homonymously (synonymously), in which case the Form is merely another particular (and so the Third Man argument goes through) or homonymously, so that they have nothing in common but the name (and so Ideas cannot be the causes and substances of sensible things); see *Met.* 991a1–8.

> however, that if there are things other than particulars these are Ideas; for besides particulars there are universals, which we maintain to be the objects of the sciences.[45]

In terms of my analysis, it is clear from this passage that Aristotle is objecting to the final step of each argument which identifies as Ideas (ἰδέαι) those things which are held to exist 'alongside the particulars' (παρὰ τὰ καθ' ἕκαστα). Furthermore, it is obvious that nothing depends on the Greek word παρὰ because it is also used in Aristotle's rebuttal to characterise the relationship of the so-called 'common things' (τὰ κοινά) to sensible particulars. In other words, he accepts the conclusion that there must exist some other things besides particulars as objects of the sciences, because of the unsuitability of sensible particulars for that role. Therefore, on the face of it, his dispute with Plato seems to be reduced to a verbal quibble about what these other things are to be called. For example, he makes no effort to explain how the objects of the sciences which he introduces differ from Ideas, either in relation to each other or in relation to sensible particulars. Of course, if we can assume that these so-called 'common things' are identical with what Aristotle elsewhere calls 'universals' (τὰ καθόλου), then we can draw upon other texts for a clarification of their ontological status. While most commentators make this assumption,[46] I have doubts about it for a number of reasons. First, as I have already pointed out, if Aristotle at this stage did have a full-fledged concept of the universal,[47] then τὰ καθόλου would surely make a more natural contrast to τὰ καθ' ἕκαστα than would τὰ κοινά. Secondly, neither here nor in any part of *On Ideas* is there any elaboration upon the ontological status of these 'common things', even though the strength of Aristotle's rebuttal might

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[45] Alexander, *In Met*. 79.17–21; Ross's translation embodies the assumption that I want to challenge.

[46] Frank (1984a: 93) unquestioningly accepts this standard assumption when he proceeds to elucidate Aristotle's first objection in terms of the difference between universals and Forms. Cooper (1973: 327–349) is more circumspect in that he faithfully reports Aristotle's use of τὰ κοινά but, while explaining what this means, he seems to fall back on the assumption that these are none other than universals. Fine (1980: 210) also notes Aristotle's usage, but she explicitly identifies τὰ κοινά with τὰ καθόλου because she finds parallel passages that describe them similarly as things that are predicated of many things; cf. *De Int*. 17a38–b2, *Soph. El*. 178b37 ff., *An. Post*. 100a6–8, 77a5–9.

[47] The *locus classicus* for such a concept I take to be *Met*. VII, 13–15 and parallel passages which show interest in similar problems about the universal as substance. If we analyse the term καθόλου literally, it seems to indicate that something is being viewed as a whole (καθ' ὅλου) and so we should seek an appropriate meaning of 'whole' in *Met*. V; see Lloyd, 1981: 6. Such a philological analysis also provides a clear connection with the whole/part problem which is the dialectical counterpart of the One/Many problem inherited from Plato.

seem to depend on such an alternative to Ideas as objects of the sciences. We find him relying almost exclusively on dialectical refutations of the Platonists which show, for instance, that their arguments lead to inconsistency or absurdity. This is especially noticeable in his rebuttal of the so-called 'One over Many'[48] argument which characterises an Idea as something apart from sensible particulars that is a separated and eternal entity (ὂν κεχωρισμένον … ἀΐδιον).[49] Here, if anywhere, we should expect Aristotle to point out that what is predicated 'in common' (κοινῶς) of many particulars need not be separated from them. But, surprisingly enough, there is no mention of such an ontological | distinction and the bulk of the refutation proceeds in a [105] dialectical fashion.[50]

His procedure is similar in the refutation of the arguments 'from the sciences'. In this case he singles out the argument from the productive sciences, namely, that there must be Ideas of the products of the arts since every art does its work with reference to one self-identical thing which is other than particular things. Then he asserts without a great deal of explanation that this argument proves either too little or too much. From Aristotle's point of view, it proves too little because it fails to establish the being (τὸ εἶναι) of Platonic Ideas. Dialectically adopting the Platonic viewpoint, however, he claims that the argument is too successful because it establishes Ideas which the Platonists would not accept, e.g. the Idea of Bench-itself. To put it another way, Aristotle's claim is that if the argument can be applied to the medical art to prove that there is a Health-itself, then it can also be applied to other arts like carpentry, sculpture, painting, and building, with results that are unacceptable to the Platonists. Now this is rather puzzling because of the prominence given to the arts as exemplars of knowledge in the early Platonic dialogues and, specifically, in view of the fact that the example of the bed

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[48] The 'One over Many' may well have become a conventional phrase used to refer to an Idea, though it does not seem to have had the imprimatur of Plato himself; see Fine, 1980: 197–240.

[49] Patterson (1985: 44) suggests that the eternal mode of being of Ideas entails an independence from the sensible world which Plato thought to be necessary for the existence of immutable standards of goodness and intelligibility. By contrast, such independence is not a possible mode of being for immanent universals and we should expect Aristotle at least to mention this if he was concerned with the ontological question.

[50] An anonymous reviewer has rightly drawn attention to the weakness of any argument *ex silentio*, even though my purpose is simply to note a lack of interest in questions about substance where we might have expected to find them. I am merely suggesting that, in the absence of any discussion of such questions in *On Ideas*, perhaps we should be more cautious when speculating about Aristotle's views concerning the ontological status of the so-called 'common things'.

is used in the *Republic* (596a) to illustrate the uniqueness of an Idea. But perhaps Aristotle is thinking of some later Platonists in the Academy who took very seriously the fastidiousness about Ideas which seems to develop in the *Parmenides* (129a). It seems to have been part of the Platonic tradition to have doubts about whether some of the crafts, especially the imitative crafts, have Forms as their objects.[51]

Yet I am not satisfied that this makes complete sense either of the arguments 'from the sciences' or of Aristotle's rebuttal which depends on the argument being extended to the imitative crafts, with unacceptable consequences for the Platonists. In general, I find his rebuttal to be rather weak, especially when he admits the soundness of the arguments, except for the last step, and then fails to spell out the essential differences between Ideas and his own candidates for the objects of the sciences, namely, τὰ κοινά. After all, Plato could also have used such terminology to refer to Ideas, so the different name does not in itself tell us anything.[52] Many commentators have yielded to the natural temptation to fill this explanatory lacuna by drawing upon other Aristotelian texts which talk about universals. But none of them seems to have attached importance to the peculiar absence from *On Ideas* of the term τὸ καθόλου which is the most obvious contrast to the term for the particular, i.e. τὸ καθ' ἕκαστον.[53]

If Aristotle's concept of the universal is to be found in *On Ideas* then, besides the argument 'from the sciences', the most natural place to search for it would be in the argument 'from thinking'.[54] Indeed, this argument begins very promisingly with a list of recognisable universals like 'man', 'footed', and 'animal', each of which is held to be an object of thought which is: (a) some thing that is (τῶν ὄντων τι) and (b) identical with none of the particulars (οὐδεν τῶν καθ' ἕκαστον). The reason for this claim is that when the perishable particulars are destroyed the same thought (ἔννοια) remains. Thus

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[51] On this point I am convinced by Frank's argument (1984b: 55–57) that Aristotle does not misrepresent Plato but rather insists that the latter be consistent in positing Forms for all the crafts, instead of distinguishing (as Plato does in the *Republic*) between the imitative and productive crafts.

[52] Most of the Platonic passages cited by Ast (1835, I: 194–195) involve the colloquial use of κοινός where the natural contrary is something like ἴδιος; see *Rep*. 497a, 535b, *Phil*. 33d. However, there is one passage in the *Theaetetus* 185b where τὸ κοινόν is used in a context that suggests a reference to Ideas such as Being, Sameness, Otherness, Unity, Duality, and Similarity. See Brandwood 1976: 506–507.

[53] See *De Int*. 7, 17a38–b1, which is often cited as the standard passage for the distinction between the universal and the particular: λέγω δὲ καθόλου μὲν ὃ ἐπὶ πλειόνων πέφυκε κατηγορεῖσθαι, καθ' ἕκαστον δὲ ὃ μή, οἷον ἄνθρωπος μὲν τῶν καθόλου Καλλίας δὲ τῶν καθ' ἕκαστον.

[54] See Alexander, *In Met*. 81.25–82.7.

the Platonists hold it to be obvious that besides (παρά) sensible particulars there is something which we think even when these have perished, and such a thing is a Form or an Idea. Now Aristotle's objection (as reported by Alexander)[55] is rather surprising in that it concentrates on showing that the argument 'from thinking' also establishes Ideas of perishable particulars like Socrates and Plato. The grounds for such a claim are that we think of such particulars and that imagination (φαντασία) preserves an appearance (φάντασμα) of them when they no longer exist.

[106] But it is difficult to see how this objection can count against Plato, who would hardly admit that appearances are identical with Ideas or even that imagination is essential to thinking of Ideas. It would seem that either Alexander or some later commentator sensed the weakness of the objection and added a stronger conclusion along the same lines as the argument 'from the sciences'. For there is an alternative version of Alexander's commentary (82.6–7) which concludes that, while the argument fails to prove that there are Ideas, it does establish that there is something else besides particulars. That is to say, the universal which is in the particulars (τὸ καθόλου τὸ ἐν τοῖς καθέκαστα) fits the description but does not necessarily import an Idea. Given the complete absence from *On Ideas* of the term for 'universal', I suspect that it has been 'imported' here by some commentator who is aware of the weakness of the objection based on our capacity to have images of sensible particulars. Yet respect for tradition should force us to entertain the possibility that, when the universal is said to be 'in the particulars', this might provide a hint as to the ontological status of the 'common things'. The most immediate problem is how to reconcile such language with the use of παρά in both arguments to describe the relationship between perishable particulars and these alternative objects of knowledge and of thought.

In order to deal with this problem, it may prove useful to look again at the 'One over Many' argument for the existence of Ideas which Aristotle rehearses and rebuts in *On Ideas*. As reported by Alexander, the argument goes as follows:

> They also use this sort of argument to establish ideas (ἰδέαι). If each of the many men is [a] man, and each of the many animals [an] animal, and similarly in the other cases; and if in the case of each something is not predicated of itself, but there is something which is predicated of all of them, and is not the same as any of them (οὐδενὶ αὐτῶν ταὐτὸν ὄν), then there must be something besides (παρά) the particulars (τὸ καθ' ἕκαστα) which is separated (κεχωρισμένον) from

[55] *In Met*. 82.3–5.

> them and eternal (ἀΐδιον). For it is always predicated in the same way of the succession of numerically different particulars. But what is a one over (ἐπί) many, separated from them, and eternal is an idea. Therefore there are ideas.[56]

Among all of the arguments reported, this one is noteworthy for its explicit description of the mode of being of Platonic Ideas as being 'separated' and 'eternal'. The explanation given for such a characterisation of an Idea is that it is always (ἀεί) predicated in the same way of all those numerically different particulars in turn. Furthermore, this single predicate of a group of particulars is not identical with anyone of that group. Thus the Idea is also described as a One over (ἐπί) Many since it is a unique entity 'alongside' (παρά) the plurality of particulars of which it is predicated. But these prepositions become informative about the mode of being of an Idea only if we can explicate the epithets κεχωρισμένον and ἀΐδιον which Aristotle uses to differentiate them from perishable particulars.[57] This becomes even clearer when he concludes that the Platonic argument does not prove that there are Ideas, even though it does tend to show that what is predicated in common (τὸ κοινῶς κατηγορούμενον) is different from the particulars of which it is predicated. From this conclusion I think we can infer that Aristotle's common predicate is to be distinguished from a Platonic Idea by virtue of not being
[107] separated from the perishable particulars of which it is | predicated. Perhaps that is the meaning of Alexander's remark that the argument 'from thinking' proves that there is something besides particulars which corresponds to the universal in particulars. Such a remark might suggest that Aristotle espouses what we would call an *in re* theory of universals, at least in *On Ideas*.[58]

If that were the case then we should compare and contrast his view with that of Eudoxus of Cnidus who is reported to have modified Plato's theory of Forms by positing them as being *in* sensible things.[59] As the leading

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[56] Alexander, *In Met.* 80.8–15, trans. Fine 1980: 199.

[57] Fine (1980: 205) takes the first epithet to mean that the existence of an Idea is independent of any or all sensible particulars.

[58] Briefly put, such a theory would hold that there is some 'common nature' which is present in and shared by more than one particular. Lloyd (1981: 1–2) argues that the Aristotelian theory of universals is not *in re* but *post rem*, whereas his theory of forms is *in re*. I would argue, however, that in *On Ideas* he has not yet made the distinction between universals and substantial forms. Thus I would tend to agree with Fine (1980: 210) that τὰ κοινά are genuine properties of things, though I would hold that they are not identical with what are later called 'universals'.

[59] See Lasserre 1966. The fragments which are listed under the heading of philosophy are mainly derived from Alexander's commentary on the *Metaphysics* and they seem to be in the form of potential objections to the doctrine of Eudoxus. At the end of this selection, we find Alexander's remark that the opinions of Eudoxus were examined in the second book of *On*

mathematician of the Academy, Eudoxus developed a completely *general* theory of proportion by focusing upon the *common* properties of all types of quantity. If we take this as the historical background, perhaps we can make more sense of Aristotle's dialectical strategy in rebutting the argument 'from the sciences' when he simply assumes that there are 'common things' which can replace Ideas as objects of science. Yet it seems that he considered the Eudoxan view to be a clumsy solution to the outstanding difficulties about Platonic Forms (see *Met*. 991a14). From the extant evidence it would appear that Eudoxus proposed a rather crude physical theory of 'mixture' as a model for the presence of Forms in sensible things, presumably in order to resolve the problem of how transcendent Forms can be causally related to the things which participate in them. According to Alexander's report, Aristotle devoted some part of the second book of *On Ideas* to showing the absurd implications of such a theory of immanent Forms. But, although these arguments are not transcribed, there seems to be no evidence of any alternative Aristotelian theory of universals which we would naturally expect to find set against the refuted Eudoxan theory of Forms. This seems to be in keeping with the negative dialectical character of the whole treatise whose purpose is fulfilled when destructive arguments are pitted against the constructive arguments which are initially rehearsed in support of Forms. Thus, given the lack of evidence, it is pointless to pursue further the question of the ontological status of τὰ κοινά in *On Ideas*.

I think that Aristotle was quite slow in addressing this question, as can be seen from a passage in the *Posterior Analytics* which denies that Platonic Ideas are necessary for a demonstrative science:

> So demonstration does not necessarily imply the being of Forms nor a One beside a Many, but it does necessarily imply the possibility of truly predicating one of many; since without this possibility we cannot save the universal, and if the universal goes, the middle term goes with it, and so demonstration becomes impossible. We conclude, then, that there must be a single identical term unequivocally predicable of a number of individuals.[60]

Ideas and shown to be absurd. This is said by way of comment upon Aristotle's claim, with reference to the view of Eudoxus, that 'it is easy to gather many impossibilities against this view'; see *Met*. 991a14.

[60] *An. Post*. 77a5–9: trans. Mure in McKeon 1941. Mure seems to have assumed that the mention of homonymy at the end of the passage justifies the characterisation of the universal as a 'term'. He does not appear to have noticed that in Aristotle's *Categories* I and II homonymy applies primarily to things or entities, just as predicates are treated as things and, derivatively, as words. Furthermore, from the presence of the technical term for the universal (τὸ καθόλου)

In many ways this passage is very reminiscent of his rebuttal of the Platonic argument 'from the sciences' in *On Ideas*, though it goes further towards clarifying the ontological difference between Ideas and his own universals. Here Aristotle is much more careful about terminology. For instance, he describes a Form as 'some one thing beside the many' (ἕν τι παρὰ τὰ πολλά) in contrast to the universal (τὸ καθόλου), which is said to be 'some one and identical thing over the many' (τι ἕν καὶ τὸ αὐτὸ ἐπὶ πλειόνων). Whereas the former is held to be unnecessary for a demonstrative science, the latter is necessary because demonstration requires that we can truly say one thing of many things (ἕν κατὰ πολλῶν ἀληθὲς εἰπεῖν). Aristotle briefly explains that the middle term of a demonstrative syllogism depends on the possibility of such true predication but | he is not explicit about whether or not Platonic [108]
Ideas satisfy this condition. At the end of the passage, however, he seems to imply that they do not when he talks about the need for a non-homonymous predicate. Following up on this hint, one might reconstruct his complaint about Platonic Ideas as being that they are homonymous (in Aristotle's own sense) on account of their characterisation as 'One beside Many' (ἕν παρὰ πολλά). According to *Categories* 1a1, things are called homonymous when they have only a name in common but have a different account of substance (λόγος τῆς οὐσίας). I think that this is reminiscent of Aristotle's frequent complaint about Ideas, namely, that they only share a name with sensible things because of their complete separation from them. Yet we must also keep in mind that there is a distinctively Platonic sense of 'homonymy' which is used to describe the relationship between a Form and the particulars which are 'called by the same name' (ὁμώνυμα: see *Phd*. 78e2, *Rep*. 596a7, *Tim*. 41c, 52a, *Soph*. 240a, *Parm*. 133d, *Met*. 987b3). Thus Aristotle may be (wrongly?) assuming that this relationship fits his own account of homonymy, so that the Forms are rendered unsuitable for demonstrative science because they are not univocally predicated of many particulars as is a universal. While this may seem to us to be merely a dialectical ruse, Aristotle clearly felt justified in forcing the dichotomy of synonymy/homonymy upon the relationship between Forms and particulars (see *Met*. 991a1–8).

If this is his argument, then Ideas may be thought unsuitable for scientific demonstration because of their homonymous relationship with the sensible things that they are supposed to explain.[61] But, in order for a syllogism to

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he seems to infer the hidden presence of the technical term for the particular (τὸ καθ' ἕκαστον) and he proceeds to translate ἐπὶ πλειόνων as the number of individuals of which the universal is predicated.

[61] Another possible reason for Aristotle to reject Ideas as unsuitable is his view that they

be demonstrative, the explanation of why something is the case must be contained in the middle term. Therefore Aristotle insists that the possibility of scientific knowledge requires that there be some one thing which is identical over many particulars, without being 'alongside' them.[62] This is what he calls 'the universal' (τὸ καθόλου) in the *Posterior Analytics*, as distinct from 'the common' (τὸ κοινόν) in *On Ideas*. But such a development in terminology is not accompanied by a corresponding development in the ontological concept of 'universal', because Aristotle is still thinking within an epistemological context. Just as in *On Ideas*, where τὰ κοινά are simply inserted to replace Platonic Ideas as objects of the sciences, so here in the *Posterior Analytics* universals but not Ideas are said to be necessary for scientific knowledge without much explanation. Neither is there any attempt to explain what sort of entities these are, nor how exactly they are ontologically related to the sensible particulars of which they are common predicates. In other words, I am arguing that these problems have not yet appeared on Aristotle's horizon of questioning. For example, he cannot yet have raised the question about substance that we find addressed in the *Categories*, since he does not use substantiality as a point of comparison between Ideas, 'common things', and sensible particulars. Finally I shall argue that, with the development of these new problem-situations, there is a corresponding development in such concepts as 'the universal' which are specifically designed to resolve the emerging problems. Like many other philosophers, Aristotle tended to turn his problems into his solutions.

III. *Substance and Universals*

As we have seen from the *Posterior Analytics* passage quoted above, one of Aristotle's central conditions for the possibility of demonstrative knowledge is that there | be some one and the same thing that is predicated [109] synonymously of many things. While we have discussed the reasons why he considered Platonic Forms to be unsuitable for that role, we have not yet

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are treated as eternal particulars and hence as unique members of their own kinds. Thus, in the case of Ideas, there is a collapse of unity in kind upon unity in number, which Aristotle insists on keeping apart in the case of universals. If my analysis is correct, this becomes an important consideration in the light of aporias about substance and the universal, which I will consider in the final section.

62 This distinction need not be given the usual ontological interpretation, since it can easily be taken epistemologically as the difference between looking to some 'pure' object of knowledge and looking to the common features of sensible things.

examined what it is about Aristotelian universals that makes them eminently suitable as objects of knowledge. Furthermore, given that the Forms were regarded as the most real things in the universe, Aristotle can hardly ignore indefinitely the question about the ontological status of the entities that were deliberately posited to replace them. However, as I will try to show, such metaphysical reflection upon universals was undertaken only in response to a perceived disparity between his epistemology and ontology.[63] In order to trace how such problems arose, I will briefly explore the conditions for essential predication set out in *Posterior Analytics* I, 4, which I will then compare with substantial predication as defined by the *Categories*. Subsequently, I will examine some of the leading aporias from *Met*. III which bear directly upon this problem of the relationship between substance and universals. Finally, I shall briefly reconstruct one possible solution proposed in the *Metaphysics* to the nest of problems that he characterises as 'most difficult'.

1. *Conditions of Essential Predication*

In *Posterior Analytics* I, 4, Aristotle sets out to elucidate the necessity which he has made a central characteristic of demonstrative knowledge and this brings him back to the basic premises from which scientific demonstrations are made. In order to explain the necessary character of the statements contained in such premises, he defines certain key terms that will be involved in the explanation, i.e. 'predicated of all' (κατὰ παντός), 'per se' (καθ' αὑτὸ), and 'universal' (καθόλου). These conditions for necessary predication are ranged in order of increasing logical strength such that universal predication represents the strongest connection between subject and attribute. Since we are interested in exploring the implications of making the universal an object of knowledge, it may be worthwhile to briefly consider each of these conditions in turn so as to see what it tells us about Aristotle's concept of demonstrative science.

He defines 'predicated of all' in a rather awkward negative fashion which essentially says that one cannot choose any part or instance of the subject to which the predicate will not belong (see *An. Post*. 73a28–34). In logical terms this may be formulated as: 'A is said of every B' (*An. Pr*. I, 1, 24b28–30). This condition of necessary predication is illustrated in terms of examples that

[63] Attempts by modern scholars such as Leszl (1972) and Barnes (1975) to explain away this disparity fail to acknowledge the importance of the aporias about this issue which Aristotle himself outlined in *Met*. III.

do not really serve to distinguish it from the other conditions, i.e. animal is predicated of every man and every line contains a point. We shall find these examples also being used for 'per se' and 'universal' predication, but then it is notorious that Aristotle is very short on good illustrations. In any case, he seems to think that such a condition for necessary predication is adequately distinguished through the sort of objection one might raise by citing an instance or a time when the predicate did not belong to the subject (*An Post.* 73a33–34). This first condition implies that a universal is not identical with a class of things which is gathered inductively because such a class would not pass the test of choosing any chance instance.

From my point of view, however, it is the second condition which is of greatest interest because it specifies two ways in which a predicate can belong *per se* to a subject. First, some predicate A belongs καθ' αὐτό to some subject B when A belongs in the definition of B, e.g. a line belongs to a triangle and
[110] a point to a line in this | manner. Aristotle's explanation of these examples is most revealing for he says that the substance (οὐσία)[64] of the subject is constituted by the predicate in the sense that the latter belongs in the formula which states what is the former.[65] Such an explanation suggests that he has in mind what we might call 'essential predication' but, as Barnes (1975: 114) notes to his chagrin, the examples do not lend themselves to the logical reversibility that we expect from analytic predications. In fact, since they trade on an Academic schema of ontological dependency,[66] there is good reason for this non-reversibility because that schema is guided by a criterion of non-reciprocal dependence, e.g. the line depends on the point for its being but not *vice versa*. I think that the same is true for the second way of essential predication, according to which B belongs in the definition of A. By way of illustration for such a predicate A, Aristotle offers the example of 'straight' or 'curved' which belong to 'line' in this manner because the formula of the essence of either of these must include a reference to line (see *An. Post.* 73a38–b3). Contrary to Barnes, I think that the examples here must guide our interpretation rather than any rigorous logical analysis which leads one to complain (as he does) that Aristotle has failed to elucidate *per se* attributes (καθ' αὐτὰ συμβεβηκότα), even though these are clearly

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[64] This logical sense of 'substance', which is practically equivalent to 'essence' in early works like the *Topics*, reflects the Platonic influence and ensures that no problem will arise about the relationship between substance and definition.

[65] *An. Post.* 73a37–38: ἐν τῷ λόγῳ τῷ λέγοντι τί ἐστιν ἐνυπάρχει.

[66] See Cleary 1988 for a discussion of the ontological and epistemological implications of this well-attested Academic schema of priority.

being illustrated. The fact that he is concerned with such attributes is subsequently confirmed when they are distinguished from attributes like 'white' which belong to 'animal' as plain accidents (συμβεβηκότα, *An. Post.* 73b3–6). This distinction between accidental and essential predication is crucial for Aristotle's explanation of how demonstrative knowledge can be necessary and also be about substances.

The connection between knowledge and substance is cemented when he explains the third sense of *per se* in terms of the distinction between substantial and *per accidens* predication. While it is characteristic of accidental predicates like 'white' to be said of something else as a subject (καθ' ὑποκειμένου λέγεται ἄλλου τινός), this is not so for substance (οὐσία) or whatever indicates a 'this' (τόδε τι σημαίνει) because this is nothing other than just what it is (ὅπερ ἐστί, see 73b6–8). It is worthwhile to compare the language here with that of the *Categories* where secondary substances such as 'man' are said to be predicated of some individual man as subject (καθ' ὑποκειμένου … λέγεται τοῦ τινὸς ἀνθρώπου) but not to be in any subject (1a20–23). It is characteristic of such predicates that both their names and definitions are also applicable to their subjects (2a19–27). I suggest that these are covered by the third sense of *per se* predication outlined in *Posterior Analytics* I, 4.[67]

We now have the elements necessary for understanding Aristotle's concept of the 'commensurate universal' (καθόλου) as satisfying all the conditions required for necessary and demonstrative knowledge. Although he does not have any special Greek expression for this very strong concept of universal, he defines it as including all the other conditions for essential predication, i.e. it is predicated of all instances (κατὰ παντός) of its subject and it belongs to that subject *per se* (καθ' αὑτὸ) and *qua* itself (ᾗ αὑτό, cf. 73b26–29). Since he had not previously used the latter expression, Aristotle is careful to explain that it amounts to the same thing as *per se* predication; for instance, 'straight' belongs *per se* to 'line' because it belongs to it *qua* line. In other words, the 'qua' locution indicates the primary subject to which the predicate belongs and it is precisely this connection which makes the predication essential or *per se*. Thus, the conditions for universal predication may be summarised as two: (i) that the predicate belong to any chance instance of the subject and
[111] (ii) that it belong to that subject | as primary (73b33–34). If such conditions are satisfied then we have the *immediate* connection between subject and

[67] Owen 1965a has suggested that such 'strong predication' constitutes a more sophisticated defense against the Third Man regress than the one in the *Topics* which depends on simply denying that any universal (or common predicate) is a 'this'. Such a suggestion fits nicely with the conjectural development of the concept of 'universal' which I am proposing.

predicate which is required for absolute first premises, according to Aristotle's account of demonstrative knowledge. Since it can function logically as a middle term in a syllogism, Aristotle insists that the universal is necessary for such knowledge.[68]

This notion of essential predication can be further elucidated in terms of the distinction between primary and secondary substance in *Categories* 5. The basis for the distinction can be found in a previous set of distinctions 'among things that are' (τῶν ὄντων) in *Categories* 2. With respect to primary and secondary substances, the crucial distinction is between (i) those things which are predicated of some subject but which are not in any subject[69] and (ii) those things which are neither in a subject nor predicated of it.[70] As leading examples of the latter kind of thing, Aristotle mentions the individual man (ὁ τὶς ἄνθρωπος) and the individual horse (ὁ τὶς ἵππος). By contrast, the first kind of thing is illustrated by 'man' (ἄνθρωπος) which can be predicated of the individual man (λέγεται τοῦ τινὸς ἀνθρώπου) but is not in any subject. This provides an initial basis for the distinction between primary and secondary substance because things that are indivisible (ἄτομα) and numerically one (ἓν ἀριθμῷ) like an individual man are never predicable of another subject. In fact, these are the criteria to which Aristotle appeals in *Categories* 5 when he declares that the particular man or the particular horse are examples of things which are called substance (οὐσία) primarily (πρώτως) and in the strictest and most special sense (κυριώτατα καὶ μάλιστα). By comparison, it is a secondary sense of substance which he applies to the species (εἴδη) and genera (γένη) under which the particular substances fall. Thus he declares, for instance, that the species man (ὁ ἄνθρωπος) and the genus animal (τὸ ζῷον) are both secondary substances, since they are both predicated of the individual man as subject though they are not in any subject.

Even within secondary substances, however, Aristotle distinguishes further between genus and species when he declares at 2b7 that the latter is 'more substantial' (μᾶλλον οὐσία) than the former, in the sense that it is closer (ἔγγιον) to the primary substance. In order to make sense of this rather odd notion of degrees of substantiality (which he explicitly denies to

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[68] By contrast, primary substance according to the *Categories* (e.g. a man) cannot function as a middle term because, even though it may serve as a subject for predicates, it cannot be predicated of anything else. In this connection, it is perhaps relevant to note that the particular is not a suitable object of scientific knowledge because it does not provide the sort of immediate connections between subject and predicate that are persuasive in themselves and that render other connections trustworthy; see *Rhet.* 1356b25–32.

[69] *Cat.* 1a20–21: τὰ μὲν καθ' ὑποκειμένου τινὸς λέγεται ἐν ὑποκειμένῳ δὲ οὐδενί ἐστιν.

[70] *Cat.* 1b20–21: τὰ δὲ ἐν ὑποκειμένῳ ἐστὶν οὔτε καθ' ὑποκειμένου λέγεται.

primary substance), we must consider the epistemological character of the explanation which Aristotle gives for such a distinction among secondary substances. He explains that if one really wants to give the 'what it is' (τί ἐστι) of primary substance, then it will be more intelligible (γνωριμώτερον) and more appropriate (οἰκειότερον) to give the species rather than the genus. It would be more informative to say of a particular man, for instance, that he is a man rather than that he is an animal. Why is this so? Aristotle explains further that the species is more peculiar (ἴδιον μᾶλλον) to the particular man than the genus which is 'more common' (κοινότερον). With regard to the so-called 'primary substances' (τῶν πρώτων οὐσιῶν), he holds it to be indisputably true that each of them signifies a certain 'this' because the thing revealed is individual and numerically one.[71] However, with regard to the so-called 'secondary substances' (τῶν δευτέρων οὐσιῶν), he thinks that when one says 'man' or 'animal' the shape of the names gives the misleading impression that a certain 'this' is also being signified. But such is not the case, for one is really indicating a certain quality (ποιόν τι σημαίνει). Aristotle makes this distinction on the grounds that 'the subject' (τὸ ὑποκείμενον) is not unique
[112] like a primary substance, since 'man' | and 'animal' are 'said of many things' (κατὰ πολλῶν … λέγεται). Hence they are κοινά in the sense that they are common to many particulars and are not 'peculiar' (ἴδιον) to any one of them.

On reading these passages in the *Categories*, one is tempted to wonder whether Aristotle thought that each primary substance had its own peculiar substantial predicates. After all, he does say that the species and the genus 'mark off the qualification of substance' (3b20: περὶ οὐσίαν τὸ ποιὸν ἀφορίζει), in the sense that they only signify substance of a certain kind (3b21: ποιὰν … τινα οὐσίαν σημαίνει). In the same vein, he also distinguishes between genus and species on the grounds that, as it were, one draws a wider boundary with the genus than with the species. For example, when one speaks of 'animal' one 'gathers in more' (ἐπὶ πλεῖον περιλαμβάνει) than when one speaks of 'man'. But this still leaves us with the question of what is peculiar (ἴδιον) to this particular man, since he shares the predicates 'man' and 'animal' with other primary substances. It is my contention that this is the question which led Aristotle to distinguish between different senses of the particular in the *Metaphysics* and even in his biological works. Of course, an adequate defence of my contention would require another full-length paper, but let me briefly delineate some features of the problem. This will also serve as a contrast to the problem-situation which we have found in *On Ideas*.

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[71] *Cat.* 3b12: ἄτομον γὰρ καὶ ἓν ἀριθμῷ τὸ δηλούμενόν ἐστιν.

As a result of our scrutiny of the so-called argument 'from the sciences', we saw that the question at issue is what sort of objects are required for the truth of sciences like mathematics and medicine. By way of answer, Aristotle simply replaces Platonic Ideas with his own 'common things', without adequately explaining the ontological difference between them.[72] One might say that he is concerned with being in the sense of truth rather than with being in the sense of substance, as I tried to show in my analysis of the second argument. Hence it appears that the problem about substance (οὐσία) is not yet on Aristotle's horizon of questioning in *On Ideas*, although one could argue that it is bound to arise because of the Platonic claim that Ideas are what are 'really real'. In the *Categories*, however, it is quite clear that Aristotle is centrally concerned with the question of what is really real, formulated in terms of substance and accident. His answer there is that a particular man or animal is the most substantial thing. While this may appear to be a complete reversal of Platonic ontology, further scrutiny introduces some doubt. In fact, primary substance in the *Categories* is something to which we can only point, so that when we want to say what it is we must resort to specific and generic terms like 'man' or 'animal' that are shared by many other individuals of the same species or genus. Yet science demands an intelligible account rather than inchoate pointing, and therefore the evidence of the sciences works against an Aristotelian and in favour of a Platonic ontology. This is a problem that Aristotle must face.[73]

2. *Puzzles about Universals and Particulars*

If we turn to the so-called 'aporetic' book of the *Metaphysics*, I think we find him addressing this and related problems in a number of different forms. Since book III can be seen to raise the difficulties to be surmounted in subsequent books, it is necessary for us to survey briefly the relevant aporias in order to grasp Aristotle's own understanding of the problem in question.[74]

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[72] I am assuming, of course, that if Aristotle had explained this ontological difference in *On Ideas* then Alexander could be relied upon to include it in his report of how these arguments are rebutted.

[73] At the end of *Met*. III, 6, for instance, we find the outline of such an aporia about science being of the universal, whereas substance is particular; see 1003a5.

[74] In the second chapter of my Ph.D. Dissertation (Cleary 1982) I have made a general argument for adopting this approach to understanding Aristotle's metaphysical problems. Such an approach to this problem is also adopted by Code (1982 and 1984) who concentrates almost entirely on the final aporia which I consider here. Heinaman (1979) adopts a similar approach with respect to the tenth aporia.

Altogether there are three aporias which | I would consider relevant and [113]
whose formulation I shall review along with some associated arguments that are instrumental in creating the impasse. In this way I hope to delineate the shape of this general problem about the relationship between knowledge and substance.

First let me consider an aporia in III, 3 which asks whether we should regard the first genera (τὰ πρῶτα τῶν γενῶν) as principles to a higher degree (μάλιστα) than the 'last predicates over the individuals' (998b14: τὰ ἔσχατα κατηγορούμενα ἐπι τῶν ἀτόμων). I think that this seventh[75] aporia must have a bearing upon the problem of universals, since Aristotle clearly distinguishes between highest genera like 'animal' and species like 'man', both of which are predicated of individual men. Any doubt about its relevance to the problem should be dispelled by the first argument which takes the form of a conditional whose *protasis* makes the assumption that universals (τὰ καθόλου) are always principles to a higher degree (μᾶλλον ἀρχαί) and whose *apodosis* infers from this that the highest genera (τὰ ἀνώτατων τῶν γενῶν) will be such principles, since they are said of all things (λέγεται κατὰ πάντων, see 998b17–19). Obviously, such a dialectical argument reflects an approach to the principles of things which is guided by the criterion that what is most universal is also most real. Thus the logic of this approach points to the conclusion that 'being' and 'unity' will be principles and substances (οὐσίαι) to the highest degree, since these are said most generally of everything (998b19–21). We can easily recognise this ontological orientation as being akin to that of Plato, and it is not surprising that most of Aristotle's subsequent arguments are dedicated to undermining such an approach to substance. For instance, he argues that even if we assume unity to have more of the character of a principle (ἀρχοειδὲς), it turns out that the infima species is more of a unity than the highest genus because indivisibility in species is the primary sort of unity (999a1).[76]

Thus Aristotle makes a very significant contrast between the unity of the genus which is divisible into species and that of the infima species or 'last predicate' (τὸ ἔσχατον κατηγορούμενον) like 'man' which, he insists, is not a genus for individual men. A similar contrast turns out to be very important

[75] For the sake of convenience, I will follow Ross (1924, I: 221–222) in his numbering of these aporias.

[76] Even though this claim about the primary kind of unity belonging to indivisible species is made within an aporetic context, I think that it reflects Aristotle's own position because, as I will argue, it becomes a crucial part of his resolution of the aporia about whether the first principles of things are particular or general.

for understanding the account of substance which he elaborates in *Met*. VII–VIII. But here in III 3, by way of a brief dialectical counter to the Platonic view, Aristotle merely says that from these objections it would appear (φαίνεται) that the species predicated of individuals are principles to a higher degree than the genera. Yet that position itself is thought to be problematic because it is not easy to say exactly how these infima species are to qualify as principles if one of the criteria for something to be a principle or a cause is that it should be capable of being separated (χωριζομένην) from the things of which it is a principle (999a17). Such a criterion for principles seems to favour those more universal predicates which the Platonists posit as being 'alongside the particulars' (παρὰ τὰ καθ' ἕκαστον) and which, as a result, are 'separate' (χωριστά). Of course, we should not infer from this dialectical argument that Aristotle himself would accept this criterion without qualification, since it is precisely on this point that he disagrees most sharply with Plato whom he takes to be positing the principles or causes of things as being separated from them.[77]

The next relevant aporia, the ninth, is formulated initially in III, 1 as the question of whether the principles are definite in number (ἀριθμῷ) or kind (εἴδει), both in the formulae (ἐν τοῖς λόγοις) and in the underlying subject (ἐν τῷ ὑποκειμένῳ) (996a1–2). | In III, 4 this is reformulated and discussed rather [114]
briefly, so that we are forced to reconstruct some of its implications and connections. The formulation there is slightly different because it launches straight into the thesis[78] by drawing implications from the assumption that the principles are one only in kind. If this is so, the argument goes, then nothing will be numerically one, not even One Itself nor Being Itself. This conclusion is obviously intended to be absurd, given that One Itself is used as a paradigm of such unity. But there is the additional difficulty that if there is not some one thing over the many (τι … ἓν ἐπὶ πάντων), then there will not be any scientific knowing (τὸ ἐπίστασθαι) (999b25–27). This is similar to the thesis of the eighth aporia, which argues that if there is nothing besides particular things (τὰ καθ' ἕκαστα) which are indefinite (ἄπειρα), then there will be no science (ἐπιστήμη) because we know things insofar as there is

[77] In fact, however, Aristotle does retain 'separable' (χωριστόν) as a criterion of substance in *Met*. VII, even though the candidate which satisfies it without qualification (i.e. the sensible compound) is not judged to be primary substance. Thus the successful candidate can satisfy the criterion only with some qualification which may be required by way of accommodation with other criteria.

[78] Here I am adopting the medieval terminology used by commentators such as Aquinas to describe the basic structure of an aporia, since it is both accurate and convenient.

some one and the same thing (ἕν τι καὶ ταὐτόν) and insofar as it belongs to things universally (καθόλου) (999a26–29). In both cases the thesis formulates an argument 'from the sciences' in language which is very reminiscent of that reported in *On Ideas*, but which is also accepted with certain modifications by Aristotle himself. However we describe the ontological relationship between the One and the Many, the consensus seems to be that for science to be possible there must be some principle which is itself numerically one, yet which belongs universally to all the particulars.[79]

But there are difficulties for this view which are introduced under the antithesis that completes the ninth aporia: if each of the principles is one in number but not also one in kind (as the principles of sensible things typically are) then there will be nothing else besides the elements (999b26–34). This implication is clarified by way of analogy with the difficulties for speech and writing which would arise if each of the letters of the alphabet were to be taken as numerically one. Playing on the linguistic parallel, Aristotle points out that if the elements (στοιχεῖα) of the voice were numerically definite (ἀριθμῷ ὡρισμένα) then the letters (γράμματα) must be just as many as the elements when one assumes (as he does for the sake of argument) that no two of them are the same in kind. Similarly, if one assumes that the principles of things have the character of being one in number, it follows that there will not be anything else besides the elements. In a further attempt to clarify this implication, Aristotle explicitly equates what is numerically one (ἀριθμῷ ἕν) with the particular (τὸ καθ' ἕκαστον) by contrast with the universal (καθόλου) which is said to be 'over these' (ἐπὶ τούτων) (999b34–1000a1).[80] Within the context of the whole aporia, this contrast would itself seem to imply that the universal is something which is one in kind. But such an implication seems to conflict with the basic assumption of the thesis that principles which are (merely) one in kind will not satisfy the necessary condition for knowledge, i.e. that there be some numerically single thing over many (ἓν ἐπὶ πάντων) (999b26–27). Perhaps it is the presence of these puzzling conflicts which

[79] Alexander (*In Met.* 216.36) explains that the object of science must be numerically one because, if it were merely one in kind, we should be forced to seek another intelligible unity which is common to all other things that are the same in kind and so on *ad infinitum*. But if one takes *Met.* X, 10 to represent Aristotle's own views on the unity necessary for a scientific object, one might doubt whether he would accept this consensus because he equates indivisibility in kind (εἴδει) with indivisibility in knowledge (ἐπιστήμῃ) (1052a32–33).

[80] This is parallelled almost exactly in *Met.* X, 10 where the particular (τὸ καθ' ἕκαστον) as indivisible and one in number (ἀριθμῷ) is contrasted with what is indivisible in kind (εἴδει) or in knowledge (ἐπιστήμῃ), which is subsequently called the universal (τὸ καθόλου); see 1052a31–36.

induces the feeling of impasse that is characteristic of an aporia. In any case, one is tempted to agree with Alexander (216.14) that the whole argument of the aporia is exceedingly verbal (λογικῶς) and dialectical (διαλεκτικῶς).

The final aporia I want to consider is listed as twelfth by Ross in the initial outline at III, 1 but it is not taken up again until the end of III, 6. As initially formulated, the aporia asks whether the principles of things are universal (καθόλου) or particular (ὡς τὰ καθ' ἕκαστα) and this formulation is
[115] retained in III, 6, except for the insertion of | λέγομεν in the description of the particular (see 1003a5–7, 996a9–10). While the simplest way of taking this insertion is as a reference by Aristotle to a common piece of terminology, it could also be taken as an attempt to describe an optional mode of being for principles, i.e. they 'exist' either in the manner of universals or in the way we say particulars do. Now either interpretation could be supported by making the obvious connection between this aporia and the previous ones about whether the principles are one in kind (εἴδει ἕν) or numerically one (ἀριθμῷ), since this distinction was practically equated with that between universal and particular (see 999a24 and 999b24). Faced with such a choice, my instinct is to pursue the more interesting line that Aristotle is asking here about two possible modes of being for the principles of things.[81]

I think that such a choice makes more sense of the subsequent discussion of difficulties which is very brief and which offers only one or two arguments on either side of the question. On the one hand, he argues, if the principles are universal then substances (οὐσίαι) will not 'exist' because none of the common things (τῶν κοινῶν) indicates a 'this' (τόδε τι) but rather a 'such' (τοιόνδε), whereas substance indicates a 'this' (1003a8–9). Against the assumption that principles have the mode of being of universals, this argument introduces the objection that none of the so-called 'common things' has the mark of substantiality, which may be characterised as 'thisness'. The objection starts from the implicit premises that there 'exist' substances and that they would be inexplicable unless their principles also shared the same mode of being. But this would not be the case if the principles were universal, since the mode of being of the latter is akin to that of a quality or, in Aristotle's terms, a 'such'. Now this argument seems to represent a departure from the view of the *Categories*, where 'man' and 'animal' are treated as substances even though they

[81] The basic reason for my choice is that I accept Gadamer's argument (1978) that, just like Plato, Aristotle turns to the λόγοι for guidance regarding the truth and reality of things. In concrete terms, this means that he consistently looks to how we speak about things in his inquiries about substance and principles.

are said to determine the quality with respect to substance (περὶ οὐσίαν τὸ ποιὸν ἀφορίζει) and are acknowledged to be predicated of many things (κατὰ πολλῶν … λέγεται).[82] However, such an acceptance of universal predicates as substantial is undermined in III, 6 by the subsidiary objection that if one sets down something predicated in common (τὸ κοινῇ κατηγορούμενον) as a 'this', then an individual like Socrates will be many particular substances. The rationale behind this argument appears to be that Socrates has many common predicates like 'man' and 'animal', each of which must be individual and separate if they are to be substances. Thus the explicit conclusion of the thesis is that the principles cannot be universal because otherwise we should have to accept these (absurd) consequences.

But, on the other hand, if the principles have the mode of being of particulars then there will be no objects of knowledge (ἐπιστηταί) because the science of everything is universal (1003a13: καθόλου γὰρ ἡ ἐπιστήμη πάντων). Once again, I think, the implicit assumption of the argument must be that everything derives its mode of being from that of the principles. So if the principles are particular then everything will be particular and no knowledge will be possible because science requires entities having the mode of being of universals. Thus the final argument is that, if there are to be sciences of these principles, we shall have to make the absurd assumption that there are other principles prior to these, which are universal predicates of them. Such an assumption is obviously absurd because the very notion of 'principle' implies that it is primary both ontologically and epistemologically. However,
[116] the objection may | be trading upon the ambiguity in 'priority' here, since the difficulty may be seen to stem from the fact that principles having the mode of being of particulars may satisfy the criteria for ontological priority but not those for epistemological priority. Perhaps this distinction between different senses of priority will help us to follow Aristotle's attempt to resolve the tension which has arisen between his epistemological and ontological views.[83]

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[82] See *Cat.* 3b13. The way in which the species and genus indicate quality is contrasted with 'white' which indicates quality and nothing else. By contrast, the species and genus are said to determine quality with reference to a substance, i.e. they signify substance as qualitatively differentiated, Yet as 'suches' they do not share exactly the same mode of being as the primary substances, which are described as 'thises'.

[83] Barnes (1975: 139–140) asserts that this is not a serious problem for Aristotle since the answer that he *should* have given is perfectly clear, that knowledge is of universal *propositions*. whereas only particular *objects* are real. Unfortunately, as Barnes himself acknowledges, Aristotle failed to reach this neat solution either here or in his explicit treatments of the

If we turn to *Met*. XIII, 10 I think we can find Aristotle's conscious attempt to resolve the aporia about the relationship between science and substance (1086b14–1087a25). It is interesting to note that, in referring back to the discussion in Book III, he describes this as a difficulty both for those who posit Ideas and for those (including himself) who do not. We should also note one or two things about the rehearsal of the aporia which illuminate it further and prepare the way for his proposed solution. On the one hand, he claims that what 'we' mean by substance will be destroyed if one does not posit substances as separated (κεχωρισμένας) in the same way as particulars (τὰ καθ' ἕκαστα, 1086b16–19). But, on the other hand, if one posits substances as being thus separable, one must accept that their elements and principles have the mode of being of particulars rather than of universals. Yet, according to Aristotle, this means that (a) there will be only as many entities as there are elements and (b) the elements will not be knowable (ἐπιστητά) because science is of universals (b19–22). However, if one posits the elements and principles to be universal, this means that what is non-substance will be prior to substance. Having rehearsed the aporia, Aristotle remarks that the consequences which give rise to the impasse follow reasonably (εὐλόγως) from making the Ideas out of elements and from postulating some unique and separated thing 'alongside' (παρά) the substances having the same form (1087a4–7).

This remark may be taken to indicate that a resolution of the aporia must avoid some or all of these characteristic Platonic assumptions which led to the impasse in thought. So, with reference to his apt illustration of the elements in terms of letters and syllables, Aristotle denies that there is any 'A Itself' or 'B Itself' beside the many (παρὰ τὰ πολλά) and so explicitly says that nothing prevents there being an indefinite number of letters and syllables of the same kind (1087a7–10). In other words, none of the elements or principles is taken to be a unique member of its own kind, as Platonic Ideas were assumed to be according to Aristotle's report (1086b27). This seems to remove one obstacle to positing substances as being separate like particulars, since their principles are still one in kind while being many in number. As Aristotle recognises, however, the most serious obstacle is that if elements are given the mode of being of particulars then they will not be knowable because knowledge is of universals. In order to clear this obstacle, he draws upon the familiar distinction between potentiality and actuality but uses it in an unfamiliar

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problem. In spite of all this, however, Barnes suggests that it is a mistake to treat this problem as a genuine difficulty for Aristotelian epistemology. Surely there is some kind of *non sequitur* here?

way with reference to knowledge and knowing (1087a15). On the one hand, he says, there is potential knowledge which being universal and indefinite (ἀόριστος) itself is *of* the universal and the indefinite while, on the other hand, actual knowledge is *of* the definite (ὡρισμένου) or *of* some 'this' (τοῦδέ τινος) because it itself is definite and a 'this'.[84]

Now there are some unusual features of this distinction which should attract our attention. As Ross notes (1924, II: 466), the distinction runs contrary to Aristotle's usual view, i.e. that actual knowledge is of universals. Should we therefore treat it as an *ad hoc* solution to the present difficulty
[117] which has no broader ramifications? | Before we adopt such desperate measures, I think that we should try to make sense of this move within the broader context of the problems which I have outlined. For instance, it cannot be completely coincidental that this passage revives the distinction between definite and indefinite objects, which we found in *On Ideas* with reference to the argument 'from the sciences'. There we saw that the Platonic Ideas and (by implication) the 'common things' posited to replace them as objects of science were described as definite, whereas sensible particulars were held to be unsuitable for that role because of being indefinite. Now it would seem as if the situation is completely reversed with the universal being described as indefinite, while the particular thing is made the definite object of actual knowledge. But I think that appearances are deceptive in this case because the particular in question is not sensible but rather intelligible. It is my proposal that some such distinction must be introduced to solve the aporias about the relationship between science and substance.[85]

In the case of the aporia under discussion at XIII, 10 (which repeats that of III, 6), the introduction of an intelligible individual as an object of actual knowledge appears to be dictated by the characterisation of the universal as indefinite and hence as a suitable object only of potential knowledge. Yet we must square this with Aristotle's standard view that actual knowledge is of

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[84] According to Smith (1921), anything which is described as a τόδε τι by Aristotle is both (a) singular, as indicated by τόδε and (b) has a universal nature which is hinted at by τι. So he proposes to translate it as a 'designated somewhat', a particular specimen of some definable nature or kind.

[85] Heinaman (1979: 249–270) makes a similar proposal for the tenth aporia when he claims that its solution requires that substantial forms be immaterial individuals rather than universals, But Code (1984) argues that the resolution of the aporia in XIII, 10 is inadequate because it is not clear how the potentiality/actuality distinction can be applied to definition. Given the historical connection between definition and the universal, this is a very powerful objection. But Aristotle may have tried to overcome it by establishing a different connection between the essence of something (which is definable) and its substantial form, which may be taken either as a particular or as a universal.

the universal, whereas actual sensation is of the particular (*De An*. 417b22–23). I think it is possible to do so by introducing the distinction between a sensible particular which is an object of sense perception and an intelligible individual, which is the object of actual knowledge. We can find evidence for this in passages where Aristotle says that actual knowing is of a 'this' (τόδε) (*De An*. 417a28, *Met*. 1048a34). What these passages suggest is that, while a universal is the proper object of our capacity for knowledge, our actual knowing is always of an intelligible individual. Thus the knowable universal would be the kind to which such individuals belong, whereas the mind engaged in the activity of knowing is always identical with some intelligible form which is indivisible. In order to resolve Meno's paradox about learning, Aristotle introduces in the *Posterior Analytics* a parallel distinction between qualified (ὡδί) knowledge which is of the universal and absolute (ἁπλῶς) knowledge which grasps the individual falling under the universal. For example, we already know in a general (and hence qualified) way that every triangle has a certain attribute but we only know this in an absolute fashion when we recognise that 'this' (τόδε) figure inscribed in the semi-circle *is* a triangle (71a19–22). While the context for this example suggests that Aristotle may be referring to a sensible figure drawn by the geometer, I think the crucial point for mathematical knowledge is that a corresponding intelligible individual exists as the subject for the attribute which is proved to belong to it.[86] If this is taken as an application of the Aristotelian logical rule about the existential import of universal propositions, then the individual which counts for the mathematical proof is intelligible rather than sensible. But, to relieve any suspicion that this is merely an *ad hoc* distinction, I must locate the intelligible individual within Aristotle's metaphysical and epistemological frameworks.

3. *No Universal Is a Substance*

In the notorious chapter 13 of *Met*. VII, Aristotle returns again to the central inquiry of the whole book when he asks whether the universal (τὸ καθόλου) is a substance. I think it has not been sufficiently noted that this question

[86] The intelligible triangle which is the subject of such attributes is analogous to the noetic unit in arithmetic that also satisfies the criteria of indivisibility and intelligibility. Even though Aristotle disputed the ontological status of such 'Intermediates' according to the Platonists, the important point for my purposes is that they could still provide him with a conceptual model for substantial form which would satisfy the criteria already outlined.

is explicitly motivated | by the reported fact that the universal appears to [118]
some people to be a cause in the highest degree (δοκεῖ δὲ καὶ τὸ καθόλου αἴτιόν τισιν εἶναι μάλιστα), as well as being a principle (1038b6–8). This is consistent with the appearance of the universal at VII, 3 as a candidate for substance among the original list, which is itself ostensibly generated from a review of previous opinions about substance (1028b33–1029a34). Hence we may plausibly assume that Aristotle's opposition to Platonic ontology motivates this whole question about the universal as substance, even though the point of such a question only becomes intelligible within his own framework. If we keep this opposition in mind, along with the relevant aporias which I have sketched from *Met*. III, I think that VII, 13 and subsequent chapters may begin to make more sense. Much of VII, 13 consists of a series of arguments which are all designed to show that none of the so-called universals (τῶν καθόλου λεγομένων) can be a substance (1038b8–9, b34–1039a2). Since these arguments have already been thoroughly worked over in the secondary literature, it is not necessary (or possible) for me to provide a fresh analysis within the purview of this paper.[87] But in spite of this voluminous commentary, there remains an outstanding problem for the interpretation of VII, 13 which may be formulated by juxtaposing the following set of Aristotelian claims: (a) No universal can be a substance; (b) The form is a universal; (c) But the form is that which is most truly substance.[88] When we add to this combination of claims the consideration that science is of the universal, we are faced with a double-barrelled ontological and epistemological problem that appears to be insoluble. Since many previous scholars have failed to find a satisfactory Aristotelian solution to this problem, I do not hold out much hope for my proposal. Yet, while previous commentators have tried to distinguish different senses of 'universal' so as to resolve the problem, I am suggesting that an alternative distinction between different senses of 'particular' may be a more promising line to take.[89]

Let me begin with a brief rehearsal of the first argument in VII, 13, 1038b9–15, which sets the stage for the whole impasse by specifying conflicting conditions for universality and substantiality:

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[87] See Albritton 1957: 699–708; Woods 1967: 215–238; Code 1978: 65–74; Driscoll 1981: 129–159.

[88] See Lesher 1971: 169–178; Heinaman 1980: 72–85.

[89] Although Aristotle's terminology is not always consistent, he tends to use τὸ καθ' ἕκαστον more frequently for the sensible particular which is typically a compound of matter and form. The intelligible individual is usually designated as τόδε τι and sometimes as ἄτομον εἶδος or even as τὸ καθ' ἕκαστον; see *Met*. 1017b24–26, 1042a28–31, 1049a35, 1070a9–15; *De An*. 412a6–9; *PA* 644a23–24; *GA* 73b34–35, 767b29–35.

(i) The substance of each thing is what is proper (ἴδιος) to it or what does not belong to another (οὐχ ὑπάρχει ἄλλῳ).
(ii) But the universal is common (κοινόν) because by nature it belongs to many things (ὃ πλείοσιν ὑπάρχειν πέφυκεν).
(iii) So if the universal is to be a substance, it must be the substance of something (τίνος).
  (iiia) It might be the substance of all the things of which it is predicated—but this is impossible.
  (iiib) It might be the substance of one of these things—but then it would be the substance of the others too because those things are themselves one, whose substance and whose essence (τὸ τί ἦν εἶναι) are one.

This argument seems to rule out all the possible ways in which the universal might be the substance of something and this appears to eliminate the possibility that it is substantial in any way. The crucial issue seems to be the defining criterion of substance which requires that it be peculiar (ἴδιος) to something, whereas a universal is by its very nature common (κοινόν) to many things.[90] If substance is to be an object of scientific knowledge, however, one must find a middle way between these conflicting | conditions for universality [119] and substantiality.[91]

The other arguments of VII, 13 serve to reinforce the impasse, however, by widening the gap between universals and substances. For instance, substance is held to be what is not predicated of a subject (τὸ μὴ καθ' ὑποκειμένου), whereas a universal is always predicated of something as subject (1038b15–16). While this criterion of substance appears to be borrowed from the *Categories*, we should notice that there it applies only to primary substances because secondary substances like 'man' are said to be predicated of an individual man as subject (*Cat.* 3a7). Therefore, commentators who assume that such secondary substances become the primary substances of *Met.* VII appear to ignore the criterion that substance is not predicated of something as a subject. But those who do notice this have tried to distinguish between the way in which a universal is predicated of a subject and the way in which the so-called 'secondary substance' would be predicated of its subject.[92] While this appears

[90] The language used here supports the interpretation of the problem which I gave earlier in connection with the distinction in *Categories* 5, 2b7–9 between the genus and the species with reference to defining the particular. There Aristotle says that the latter, the species, is more appropriate (ἴδιον μᾶλλον) than the former, the genus, which is more common (κοινότερον).

[91] Alan Code (1984) aptly identifies these conditions in their Greek versions as the τι ἐστί and τόδε τι criteria, respectively.

[92] Woods (1967) suggests that there is an implicit distinction in VII, 13 between things predicated universally and universals as a general class of things which can include substantial forms. Accepting Lesher's verdict (1971) that there is no textual basis for such a distinction,

to be a reasonable approach, commentators have failed to come up with a solution that makes sense of the text and that is consistent with Aristotle's mature ontology. My tentative proposal is that a distinction between different kinds of particular may solve this problem.

When Aristotle sets out the conditions for universality and substantiality in VII, 13, it is important to notice that he does so by specifying that the universal is by its nature common (κοινόν) to many things, whereas the substance of each thing is proper (ἴδιος) to it and does not belong to anything else. Given all the evidence I have already presented, I think that one might connect this with the distinction between the universal (τὸ καθόλου) and the particular (τὸ καθ' ἕκαστον), especially since the latter is explicitly connected with substance at VII, 1, 1028a27. But we know from the aporia in III, 4 that Aristotle characterises the particular as numerically one (ἀριθμῷ ἕν) in contrast to the universal which is one over many (ἕν ἐπὶ πάντων, 999b34–1000a1). We recall that the other difficulty about positing the principles of things to be particular is that there will be no knowledge of them, whereas if we posit universal objects of knowledge as principles there will be no substances because none of the common things (τῶν κοινῶν) indicates a 'this' (τόδε τι, see 1003a5). Now I think it is plausible to claim that VII, 13 explores a similar difficulty, although it is devoted almost entirely to arguing that no universal is a substance. Near the end of the chapter, however, Aristotle briefly develops the argument that substance must be incomposite (ἀσύνθετον) and hence cannot have a definition (ὁρισμός) or account (λόγος) (1039a14–19). Since such a result is contrary to the general and long-standing conception of substance, he acknowledges a difficulty and briefly indicates how it might be resolved by distinguishing ways in which substance can and cannot be defined. Therefore, unlike some scholars, I take VII, 13 to be a completely aporetic discussion and I think that we must follow Aristotle's concluding hint to look elsewhere for his attempt to resolve the problems raised there (see 1039a22–23).

Met. VII, 14 continues the same aporetic discussion with reference to Plato's Ideas as candidates for substance by showing the difficulties which arise for those who posit universals as separate substances, while simultaneously defining species in terms of genus and differentiae. Thus VII, 15 completes the

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Driscoll (1981) proposes an alternative one between universals which are predicated of some subject and formal causes which are predicated of matter that is not yet a proper subject of predication. In spite of all these ingenious proposals, however, I think it might be more rewarding to look for a distinction which we should expect Aristotle to make between different senses of 'particular' to satisfy the conflicting demands of intelligibility and substantiality.

aporia by arguing that particulars are indefinable, including (paradoxically enough) the Ideas which were originally posited as objects of knowledge. Aristotle begins with a distinction between substance as a composite (τὸ
[120] σύνολον) of the formula along with matter, and substance | as the formula simpliciter (ὁ λόγος ἁπλῶς) (1039b20). While the latter kind of substance cannot be either generated or destroyed, the former can because it is a composite of this form and that matter whose combination can be dissolved.[93] Therefore, as Aristotle explains, there is neither definition nor demonstration of particular sensible substances (τῶν οὐσιῶν τῶν αἰσθητῶν τῶν καθ' ἕκαστα) because they have matter of such a nature that it may either be or not be these substances, with the result that all particulars (τὰ καθ' ἕκαστα) are perishable. This variation on the argument 'from the sciences' is given a new twist when he uses it to show that not even a Platonic Idea can be defined, since it is supposed to be particular (καθ' ἕκαστον) and separate (χωριστή) (1040a8–9). His critique of the Platonists is that they are unaware of the impossibility of defining particulars among eternal things, especially those which are unique (μοναχά) like the Sun and the Moon (1040a27–29).

The point is that the definition would turn out to be common (κοινός) to all suns, whereas the Sun is a particular like Socrates or Cleon. Aristotle's analysis of the mistakes of the Platonists brings out very clearly the tension within his own ontology between substance and definition, i.e. that the particularity of a thing's substance does not appear to be reflected in its definition which must use common names. But his insistence that the positing of Ideas as separate particulars renders them indefinable seems to rule out my conjectural solution in terms of intelligible individuals. For instance, he stresses that even eternal particulars like the Sun cannot be defined, though such unique members of their own kind may have provided a misleading parallel for Platonic Ideas. According to his analysis in VII, 16, the Platonists made the mistake of positing Ideas such as Man Himself in imitation of sensible particulars because they were unable to describe the character of indestructible substances which exist apart from particular sensible substances (1040b27–34). This critique reveals Aristotle's confidence in being able to give an account of the real nature of supersensible substances like the Prime Mover, which are intelligible individuals.

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[93] By contrast, substantial form is indivisible (ἄτομον) and incomposite (ἀσύνθετον), so that it cannot be subject to the normal process of composition and dissolution that Aristotle calls generation and corruption. Just like a sensible particular it cannot be defined, not because it is perishable but rather because definition involves the analysis of something into its logical parts, whereas the intelligible individual does not have such parts.

Such statements as we find in VII, 15 and 16 give the impression that Aristotle completely rules out the possibility of defining any sort of individual, but I think we must resist this conclusion because he held substance to be definable and to be a 'this'. In order to reconcile these two apparently conflicting criteria of substantiality, we must briefly review some passages in which they are used to decide whether or not some candidates qualify as substances. In *Met*. V, 8, for instance, among a list of different ways of speaking about 'substance', we find the shape or form of each thing being judged to be substantial because it is a 'this' (τόδε τι) and separable (χωριστόν) (1017b25–26). This way of speaking about substance is contrasted with that of the ultimate substratum (τὸ ὑποκείμενον ἔσχατον) which is never predicated of anything else. Whether we take this as a reference to matter or to the concrete individual (following the *Categories*), it is clear, by contrast, that the substantial form of each thing cannot be construed as a sensible particular, in spite of its characterisation as a 'this'. But perhaps we can identify it with the essence (τὸ τί ἦν εἶναι) which is also called the substance of each thing and whose account is a definition (1017b21–22). Important support for such an identification can be found in *Met*. VIII within the context of a discussion of the 'generally accepted' substances among which sensible bodies and their parts feature prominently. But, according to Aristotle's analysis, material substance is not actually but only potentially a 'this', or as he puts it elsewhere, | it is a 'this' only in appearance (1070a11–12). By contrast, [121]
substance in the manner of the λόγος is actually a 'this' and is separable in account (τῷ λόγῳ) (1042a28–29). It is difficult to clarify the relationship between this sense of separation and 'thisness' as a characteristic mark of substance, given that the absolute separation (χωριστὸν ἁπλῶς) which belongs to the sensible compound is also related to its being a 'this' (1037a1–2).

Perhaps the best approach is to review briefly the major points of VII, 17, where Aristotle begins again from a fresh perspective in his attempt to specify what sort of thing should be called a substance. Even though attention has been focused upon sensible substances, I find it significant that he explicitly mentions the possibility that something may be clarified for the projected inquiry into supersensible substances (1041a7–9). In view of his previous critique of the Platonists, I would claim that what has been clarified is that such substances cannot be conceived as sensible particulars, even if these are made eternal and unique like the Sun. So what is needed is the alternative conception of an intelligible individual which satisfies all the relevant criteria of substance, including definability. With respect to sensible substances, this conception covers the substantial form which is the cause both of the unity and intelligibility of the particular composite thing,

which itself is a 'this' and separate in an absolute sense. As the principle responsible for such characteristics, therefore, the form must be both a 'this' and separate, even if form is separate only in a qualified logical sense for sensible substances (1017b24–26, 1042a28–29, 1049a35–36, 1070a11–12). But since the substantial form is also the essence, logically speaking, it satisfies the criterion of definability because a definition states what something is and this is determined primarily by the form (1041b4–9). However, this form cannot be a universal in the strict sense because, as Aristotle has consistently argued, no universal is a substance. On the other hand, the substantial form cannot be a particular in the manner of sensible composites because these are indefinable according to the argument of VII, 15. Therefore, the resolution of the aporia requires the concept of an intelligible individual which is capable of having the apparently conflicting characteristics of 'thisness' and definability. I suggest that this is Aristotle's concept of substantial form, which is predicated of a material subject and so is not a universal but which is not a composite particular either, though it is responsible for the particularity and separateness of sensible substances. While the concept 'intelligible individual' may appear to be internally contradictory, I think that it represents a classic example of Aristotle turning his problems into solutions through conceptual innovation.

Conclusion

In this paper I have argued for the general thesis that a development can be found in Aristotle's concept of the universal, roughly corresponding to the development of his problem-situation. Through an analysis of the so-called arguments 'from the sciences' in *On Ideas*, I have tried to clarify the character of the problem about scientific objects which he inherited from Plato. For instance, if he denies the existence of Ideas then Aristotle would appear to be depriving the sciences of foundations, since he also accepts that particular sensible objects are unsuitable as objects of knowledge. I have argued that it is this problem about the truth of the sciences which leads him to introduce the notion of 'common things' (τὰ κοινά) as alternatives to Ideas in *On* | *Ideas*. [122] However, on philological and other grounds, I have expressed doubt about the complete identification of these common things with universals. In order to justify my doubt, I try to show briefly how Aristotle's mature concept of 'universal' may have developed as a response to a problem that does not appear on the horizon of questioning in *On Ideas*, namely, the problem about substance and its relationship to scientific knowledge. The development of

this problem can be traced through the *Categories* to Aristotle's definitive denial of substantiality to universals (and to Platonic Ideas) in *Met*. VII, 13. But this denial is clearly part of an aporia which is outlined in *Met*. III concerning the relationship between science and substance, given their conflicting criteria of universality and particularity. I think that this gives us a clear indication of the problem-shift which has taken place in the *Metaphysics*, as compared with *On Ideas* or even with the *Posterior Analytics*. Furthermore, I think it is reasonable to argue that there is a concomitant development in Aristotelian concepts like 'universal', 'particular' and 'individual', which are pressed into service to resolve this 'most difficult' problem.

Introduction

The task of elucidating the function of *phainomena* in Aristotle's method (or methods)[1] of inquiry raises some philosophical and historical problems. Historically, it is unclear how the astronomical method of 'saving the phenomena' developed within the context of Plato's Academy and its scientific and philosophical projects. On the one hand, it is reported that he prescribed such a method to contemporary astronomers for the reform of their science, yet on the other hand it is hard to believe that an amateur could lead professionals by the nose. Due to the importance for ancient astronomy of the contributions made by Eudoxus and Callippus, one must assess how much Aristotle was influenced by their methodological approach in his own scientific inquiries. Given his departmentalisation of the sciences, however, we cannot assume that he applied the method of a mathematical science like astronomy in a straightforward way to other theoretical sciences like philosophy or to practical sciences like politics. Thus, in view of the radical differences between these sciences both in subject-matter and in precision, it has been doubted whether they can share a common methodology.

In view of this doubt, my paper will concentrate on exploring how *phainomena* function in Aristotle's theoretical and practical sciences. Against Terence Irwin's attempt to distinguish sharply between empirical and dialectical inquiries, I will argue that for Aristotle different kinds of science share a common procedure in which *phainomena* perform two major functions. First, they serve as the starting-point of every search for first principles, especially when the science in question is demonstrative, since Aristotle insists that these principles themselves cannot be demonstrated. But the second function of *phainomena* is to provide a test for the adequacy of the first principle that emerges from the initial stage of inquiry. In fact, his method of first

[1] Since there is a scholarly dispute as to whether Aristotle has one or more than one method of inquiry, I do not wish to beg the question in this paper when I use the singular for the sake of convenience, while discussing the issue about the singularity or plurality of his methodology. Aristotle's term 'method' may itself imply a plurality of 'ways' because μέθοδος can refer to any discipline (πραγματεία) or way of inquiry (*Top*. 101a19–21, 101b3–4; *De Part. An*. I, 1, 639a1).

reviewing the *phainomena* is based on the assumption that some truth is hidden in them, whether they be sensory appearances or | common opin- [62]
ions. Aristotle's chief methodological problem is to specify a way of finding the appropriate first principles among a jumble of sensory appearances and common opinions which one can easily collect on any subject. In order to show that these principles are suitable, he must specify how one can give some justification for what are indemonstrable 'firsts'. Once the first principles have been secured, then Aristotle's syllogism is the appropriate tool for drawing out the conclusions in a way that preserves whatever truth or plausibility is contained in the premises. I shall not concern myself here with this standard way 'from the principles', except to note that it is often absent from Aristotle's inquiries, possibly because it presents less difficulty than the way 'to the principles'.

I will try to show how Aristotle justifies first principles in a way that parallels the so-called method of 'saving the phenomena'. It involves gathering the *phainomena* in a comprehensive way such that all or most of the logical possibilities are covered, and such that they conflict with each other. As a result the inquiry generates puzzles which are resolved by a thorough scrutiny of the *phainomena* in order to discover a tentative first principle that will prove its mettle by 'saving the phenomena'. When all of this has been done, according to Aristotle, it is sufficient as a 'proof' for a first principle which now becomes the starting-point for theoretical demonstration or practical action.[2] In this way reputable opinions (ἔνδοξα) and authoritative appearances play a central role as tests for first principles in a method of inquiry that is common to his theoretical and practical sciences. Such reliance on *phainomena* is typical of Aristotle's philosophical thinking, as distinct from Parmenides and Plato who insist on a sharp contrast between appearance and reality.

I. *Historical Context*

According to Simplicius (*In De Caelo* 488.18–24, 493), it was part of the Platonic tradition in astronomy to take its central task as that of 'saving the phenomena'. Possibly motivated by the assumption that the motion

[2] For Aristotle the goal of the practical sciences is action, and for this the fact (τὸ ὅτι) is sufficient as a first principle; whereas theoretical sciences require a demonstration which also shows the reason why (τὸ διότι) something is the case. After the discovery of first principles in either type of science, however, the way 'from' the principles is mapped out in syllogistic form by Aristotle. Thus, for the purposes of this paper, the crucial question is whether the way 'to' the principles has a common structure.

of divine bodies must be perfectly circular and uniform, Plato reputedly set astronomers the task of finding the number and arrangement of such motions that must be posited to explain the apparently irregular motion of the planets. This seems to have been the problem that exercised Eudoxus when he put forward his theory of homocentric spheres, and Callippus when he modified his theory to make it conform better with certain important phenomena. In these cases the phenomena were the position, shape, and motion of the most visible heavenly bodies, especially those associated with the signs of the zodiac. But the most difficult problem for astronomers was that of the apparent retrogradation of the planets to which Plato also refers in passing at *Tim*. 40c.

[63] It was to the latter problem, in particular, that Eudoxus' theory of concentric spheres represented such a brilliant and original solution.[3] Here the phenomena are treated as significant and, hence, as being in need of 'saving' through the hypothetical method of positing the real motions, which are assumed to be uniform and circular. The showpiece of this whole ingenious theory was the manner in which it could reproduce the apparent retrograde motion of the planets (in the idealised form of a hippopede) through the combined motions of different spheres set at different uniform speeds and angles of rotation (see Schiaparelli 1877, and Neugebauer 1952). Even if the Eudoxean model was not fully determined quantitatively, it gave a plausible qualitative and geometrical solution to the problems surrounding the retrograde motions and stations of the planetary bodies. As such it was accepted as a paradigm by Callippus and Aristotle, who introduced additional spheres for a better fit between the model and the phenomena.

This is the historical problem-situation within which we must locate the method of 'saving the phenomena', and I claim that subsequent adaptations within philosophical contexts should be understood in relation to it.[4] Similarly, I think that the meaning of φαινόμενα within this specific context is at least partially definitive for its broader use in other scientific and philosophical inquiries. Thus we must take note of the fact that Eudoxus wrote a book

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[3] Mittelstrass (1962) claims that Eudoxus was responsible for coining the phrase σώζειν τὰ φαινόμενα, whereas Kranz (1957) thinks that it originated with Heraclides of Pontus. Skemp (1979) rightly points out that, whoever coined the phrase, its proper historical context is the planetary problem in ancient astronomy.

[4] Among the Presocratic natural philosophers, the term φαινόμενα had a much broader reference to all natural appearances, which are thought to provide a glimpse of a hidden reality, e.g. Democritus DK 55A111 and Anaxagoras (46B21a: ὄψις ἀδήλων τὰ φαινόμενα. Cf. Diller 1932). In general, this involves reasoning by analogy from the visible to the invisible, by contrast with the hypothetical method used in the Pythagorean and Platonic tradition.

entitled *Phainomena* which contained a detailed description of the heavens, together with fairly exact information about which constellations rise and set together.[5] For instance, he reports that 'beneath the tail of the Little Bear lie the feet of Cepheus, making an equilateral triangle with the tip of the tail' (Hipparchus I, 2.11). Such a mixture of empirical observation and geometrical idealisation is what seems to constitute most of these phenomena.[6] Similar observations can also be found in Aristotle's *De Caelo* and *Meteorology*, where he refers to what 'we have seen' in the heavens (*De Caelo* 292a3, *Meteor*. 345a1, 343b1). Yet, given his wider use of the term φαινόμενα, it is important to note that he was aware of the difference in reliability between our perception of heavenly bodies and of things on this earth (*De Part. An*. I, 5, 644b24 ff.). In spite of this, however, he insists on the parallel between the method of astronomy and that of other more physical sciences (*An. Pr*. 46a19–21 and *De Part. An*. 639b7–11). One of my major claims here is that this parallel had a profound influence on Aristotle's own method of scientific inquiry.

II. *Aristotle and the Astronomers*

In assessing the influence of contemporary astronomy on Aristotle's method of inquiry, one should begin with *Metaphysics* XII, 8 because not only does it reflect his attitude toward practising astronomers but it also includes a modest contribution to the science. There we can observe at first hand his | [64] own appropriation of the astronomical method of inquiry, while elucidating the reasons for Aristotle's unusual deference toward this most physical of the mathematical sciences, as he describes it elsewhere (*Phys*. II, 2, 193b25–26).

It is quite significant that the astronomical discussion in XII, 8 occurs within the context of a general metaphysical inquiry about supersensible substance, whose existence and nature have been established in previous

[5] Most of what survives from Eudoxus' *Phainomena* is in a verse form made by Aratus, e.g. Fr. 110–111: 'When the Fishes [Pisces] rise, one can see rising along with them, among the northern constellations, the rest of Andromeda, the right-hand side of Perseus, the Triangle which is above the Ram; and among the southern constellations the head of the southern Fish. One can see setting at the same time among the southern constellations the Altar and the rest of Hydra; among the northern constellations, one is setting.'

[6] Fr. 11: 'There is a certain star which always remains in the same spot, and this star is the pole of the universe.' This conflicts with the more accurate report of Pytheas of Marseilles that there is no star at the pole but an empty space surrounded by three stars roughly forming three angles of a square. In order to explain such a conflict, Lasserre (1964: 130) suggests that Eudoxus imagined a star at the pole because he had a preconceived idea that the pivot of the sky must be marked in this way.

chapters. Therefore, the guiding question for this chapter is whether there is one or many of such substances. The argument for the existence of at least one unmoved mover was based on the apparent fact that the whole universe has one simple (diurnal) and eternal motion. But, since there are other simple locomotions (e.g. the planets move in the opposite direction along the ecliptic) which are eternal, then it is reasonable to assume that there are other unmoved movers, which are ultimately responsible for these motions. So Aristotle argues that there will be just as many such substances as there are simple and eternal motions, and that they will be ordered in the same way (1073a36–39). In support of his metaphysical argumentation, he calls upon the science of astronomy:

> Now as regards the number of locomotions, this should be the concern of the mathematical science which is closest to philosophy, and this is astronomy; for it is this science which is concerned with the investigation of sensible but eternal substances, while the others, such as arithmetic and geometry, are not concerned with any substances. (*Met*. 1073b3–8, trans. Apostle)

Here Aristotle differentiates between astronomy and other mathematical sciences, such as arithmetic and geometry, in terms of the ontological status of their respective objects of inquiry, rather than in terms of different methods for mixed and for abstract sciences. Since he differentiates sciences in terms of characteristic objects, their ontological status may have implications for the sort of arguments and the kind of phenomena proper to each science. Thus, even though astronomy is held to be subordinate to geometry (*An. Post*. I, 27), the ontological status of its objects makes it superior, since the heavenly bodies are both sensible and eternal substances.[7] This is what makes astronomy the mathematical science closest to philosophy, by contrast with those which study merely 'abstract' objects. While this contrast has many interesting implications, I will focus on what it means for the method of astronomy, by comparison with that of arithmetic or geometry.

With respect to this question, the most important point about astronomy seems to be that it studies *sensible* substances, whereas arithmetic and geometry study abstract intelligible objects. This is important because, although the astronomer uses hypothetical constructions just like the geometer, he cannot ignore the sensible phenomena in assessing the truth of his hypotheses. Furthermore, while an inexperienced boy can learn geometry, | he cannot [65] learn astronomy without the right sort of experience, which involves among other things the observation of heavenly bodies. It is precisely on these points

[7] See *Phys*. 196a33; *Met*. 1026a18, 1074a30; *EN* 1141b2–3.

that Aristotle parts company with Plato (in *Republic* VII) when the latter urges astronomers to reform their science by treating things in the heavens just as a geometer treats diagrams, i.e. as useful but as dispensable. This parting of the ways is nicely underlined in the above passage where Aristotle looks to astronomers to settle the empirical[8] question of just how many simple and eternal motions are necessary to save the phenomena. Although Plato's hypothetical method is not abandoned, the phenomena function as the last court of appeal in deciding on the truth of astronomical hypotheses. Aristotle is also willing to accept tentative answers:

> But as to the number of these, we may for the present give an indication by quoting what some mathematicians are saying, so that there may be in our thought a belief in some definite number; as for the rest, we should partly investigate ourselves and partly inquire from those who investigate the subject, and if those who are investigating this subject have opinions contrary to those just stated, we should respect both views but accept the more accurate.
>
> (*Met*. 1073b10–17, trans. Apostle)

Here we find some valuable hints as to how Aristotle appropriated the typical method of astronomy, especially given the privileged relationship of that science to his own metaphysical inquiry. In order to settle the question of how many supersensible substances exist, for instance, one must determine through astronomy just how many simple and eternal motions there are in the universe. Although Aristotle is not satisfied that this has been conclusively decided, he reports the views of both Eudoxus and Callippus in order to show how the systematic correlation will work. While he engages in some astronomical speculation himself, he is prepared to accept better informed opinions from experts in the science. But the general methodological rule governing the whole inquiry is that, while contrary opinions are to be respected (φιλεῖν), only the more accurate (ἀκριβεστέροις) are to be accepted as persuasive (πείθεσθαι) (1073b15–17). Although 'saving the phenomena' refers especially to the sensible heavens, I think that this rule can be seen to guide Aristotle's own philosophical and ethical method of inquiry in which the most reputable opinions are gathered, tested and preserved. In this regard,

[8] Throughout this paper I use the term 'empirical' not in the modern positivist sense but in the ancient sense of something that involves experience (ἐμπειρία). Similarly, Irwin appeals to the Aristotelian account of how one gains experience as a result of sense perception, but he takes this to be quite different from an inquiry that begins with common opinions. Yet I see no good reason to attribute this distinction to Aristotle, and hence I take experience to cover all types of processes which yield appropriate general principles in different kinds of inquiry, e.g. habituation in ethics or dialectical practice in philosophy.

one should note that his conclusions are described as being 'reasonable' (εὔλογον) rather than as being necessary (1074a15–17).

The importance of astronomy for Aristotle's conception of scientific method is shown by a passage in *Prior Analytics* I, 30, where that science features prominently as a paradigm. The context is provided by some general
[66] methodological remarks which are clearly intended to apply in all cases, | whether in philosophy or in any craft (τέχνη) or in any theoretical inquiry (μάθημα). The whole chapter serves as a kind of summary of Aristotle's previous discussion of how syllogisms are constituted from premises which are themselves constructed from terms connected in certain ways. With reference to this discussion, he now (46a8–10) makes a general distinction between demonstrative syllogisms that begin from true premises, and dialectical syllogisms that start from plausible premises.[9] But logic by its very nature is general, whereas the peculiar (ἴδιαι) principles of each science must be sought in experience:

> Consequently it is the business of experience to give the principles which belong to each subject. I mean for example that astronomical experience supplies the principles of astronomical science; for once the phenomena were adequately apprehended, the demonstrations of astronomy were discovered. Similarly with any other art or science. Consequently, if the attributes of the thing are apprehended, our business will then be to exhibit readily the demonstrations. For if none of the true attributes of things had been omitted in the survey, we should be able to discover the proof and demonstrate everything which admitted of proof, and to make that clear, whose nature does not admit of proof. (*An. Pr.* I, 30. 46a18–26, trans. Jenkinson)

Although this passage does not specify how astronomical hypotheses are to be justified in relation to the phenomena, yet it is significant that astronomy is cited as a model for all inquiry which uses the collection of phenomena as a way to first principles. In fact, as Heath (1949: 25) notes, there is historical evidence that Aristotle is reporting an established distinction among astronomers between observational and theoretical astronomy. Eudoxus, Aratus, Euclid and Geminus are all credited with books of observations, bearing the conventional title *Phainomena*, which are different from works of theoretical astronomy (ἀστρολογία or σφαιρική). Thus Aristotle is following the precedent of astronomy when he accepts as a general methodological rule that one must first collect the phenomena given in experience before

[9] Ernest Kapp (1942) has shown convincingly that the search for appropriate premises to construct a syllogism is best understood in terms of a dialectical situation in which one already knows the conclusion (e.g. the fact that the planets do not twinkle) but not the reason why (i.e. that they are near).

one can find the appropriate first principles for any science or art. I claim that he himself follows this rule throughout his empirical and dialectical inquiries.[10]

The anticipated outcome of a comprehensive collection of astronomical phenomena, according to the above passage, is that one will find the proofs for everything that is demonstrable and also show what is by its nature indemonstrable. Although Aristotle does not supply any examples, he may have in mind the *Posterior Analytics* distinction between substantial subjects like the sun or the moon, which are simply assumed to exist, and their attributes which are proved to belong necessarily to them by means of a middle term. This distinction is consistent with what he says about the collection of phenomena, since these will be primarily reports about the | [67] attributes of heavenly bodies which are assumed to exist on the basis of perception. In the case of a lunar eclipse, for instance, a set of careful observations of the shape of the advancing shadow may lead one to discover the hidden cause, i.e. the interposition of the earth between the moon and its source of light. This explanation can then be used as a middle term in a scientific demonstration about lunar eclipses, which presupposes the existence of sun, moon and earth. Indeed, without such preliminary assumptions the inquiry could not even begin because there would be no focus for the collection of phenomena. In Aristotelian terms, the inquiry about 'the fact' (τὸ ὅτι) precedes that of the cause (τὸ διότι), while the question of existence is prior to that of essence (*An. Post.* II, 1–2).

Let us now look at a parallel passage in *De Partibus Animalium* I, which is of interest not only because it bears on this point but also because it introduces an inquiry in biology. It contains the second of a series of methodological questions posed in Aristotle's introduction:

> Should the natural philosopher, like the mathematicians when they demonstrate astronomy, first survey the appearances in regard to the animals and their parts in each case, and only then go on to state the because-of-what (i.e. the causes), or should he proceed in some other way?
>
> (*De Part. An.* I, 1, 639b7–11, trans. Balme)

[10] By contrast Owen (1961) takes this empirical method to be associated exclusively with inquiry in natural science (ἱστορία) because he does not find it in the *Physics* where conceptual analysis rather than empirical observation is the guiding process. Thus he thinks that there is an ambiguity in the notion of 'phenomena' which corresponds roughly to the distinction between *endoxa* and perceptual phenomena. Irwin rejects Owen's thesis about two senses of phenomena, yet insists upon two quite distinct methods of inquiry that start from common opinions and perceptual observations, respectively. By contrast, I will argue that there is a single common method, but that the meaning of 'phenomena' is always relative to the subject matter, e.g. physical vs. moral phenomena.

Finding an answer to this question is a task for the generally educated person (ὁ πεπαιδευμένος) who is differentiated from the expert at the beginning of the book (639a1 ff.).[11] In any event, Aristotle's own practice as an expert inquirer about nature shows that he accepts an affirmative answer to the above methodological question. For instance, he insists that one must first grasp the appearances (τὰ φαινόμενα) about each genus and then proceed to discuss their causes (640a14–15). From the broader context and from the examples supplied, we may conjecture that Aristotle has in mind such attributes as sleep and breathing which belong to many genera of animals in different but analogous ways. This shows that, in answer to the first methodological question, he takes the view that one must first survey the common generic attributes before getting down to those which are peculiar to the species (639b3 ff.).[12] In some cases, the distinction holds within the same science, whereas in other cases it involves two different sciences. For example, acoustic harmonics yields knowledge of the fact only, while the cause is supplied by arithmetic. Similarly, nautical astronomy consists of a collection of observations, whereas mathematical astronomy provides the proper explanations. In his biological inquiries, Aristotle seems to follow the example of astronomers when he makes a general collection of data in the *Historia Animalium*, before going on to search for causes in particular treatises like *De Partibus Animalium* and *De Generatione Animalium*. Likewise, in the practical
[68] sphere, his collection of constitutions seems to | have been intended as a preliminary to his inquiry about causes in the *Politics*. In general, I think that this division has better support in Aristotle's own practice than Irwin's proposed division between empirical and dialectical inquiry.

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[11] Balme (1972: 70) thinks that Aristotle is here taking his usual stance against Plato and Speusippus, who both thought that the educated man must have an all-embracing knowledge of general principles because without knowing the whole one cannot know the part. By contrast, Aristotle holds that each science proposes its own axioms and so can be known independently of other sciences, with the result that its general principles and procedures are also independent. Later I will argue that such opposition to Platonism is encapsulated in his general distinction between inquiry conducted λογικῶς and φυσικῶς or ἀναλυτικῶς. The *Prior Analytics* passage shows how this distinction is to be applied in the case of astronomy, with the discovery of its special principles being the task of the expert while the generalist is able to judge the logical correctness of his procedure.

[12] David Balme (1972: 72–73) suggests that Aristotle's reason for this is that he thinks the generic attributes may reveal the causes of specific attributes. But I find more plausible Kullmann's suggestion (1974) that the distinction between the collection of phenomena and the search for causes corresponds closely to the distinction in the *Posterior Analytics* between knowledge of the fact (τὸ ὅτι) and of the cause (τὸ διότι).

In support of my claim, let me briefly examine Aristotle's method of inquiry in *Meteorology* and *De Caelo*, both of which illustrate how a scientist inquires into the things 'aloft' in the heavens. At the beginning of the *Meteorology*, Aristotle recapitulates on the principles of the heavenly and sublunary bodies, which he takes over from previous treatises such as the *Physics* and *De Caelo*. In fact, meteorology seems to be a subordinate science concerned with the phenomena that belong to the region between the immutable heavens and the earth itself. So Aristotle makes no attempt in the *Meteorology* to give demonstrative syllogisms, but instead follows the hypothetical method that astronomers use to save the phenomena.

In I, 3, for example, Aristotle sets out to explain comets and other phenomena, which he treats as belonging to the same region of the universe and as having the same causes. But first he recalls some fundamental assumptions about the nature and motion of the four sublunary elements, and about a fifth element which was posited in *De Caelo* I as the material of the heavenly bodies. In support of this latter principle, he cites the general consensus among previous thinkers:

> This is an opinion we are not alone in holding: it appears to be an old belief and one which men have held in the past, for the word 'ether' has long been used to denote that element. Anaxagoras, it is true, seems to me to think that the word means the same as fire. For he thought that the upper regions were full of fire, and that men referred to those regions when they spoke of ether. In the latter point he was right; for men seem to have assumed that a body that was eternally in motion was also divine in nature; and, as such a body was different from any of the terrestrial elements, they determined to call it 'ether'. (*Meteor*. I, 3, 339b20–27, trans. Webster)

Two important points about Aristotle's canons of evidence are illustrated in this passage. By contrast with Plato, he treats universal consensus as one indicator of truth and so he seeks support for his own principles in the views of predecessors. Secondly, Aristotle appeals to linguistic evidence in support of what we would regard as an empirical claim about the material of the heavenly bodies. But such an appeal may seem less strange if we view language as a repository for the experience of previous generations.

If one assumes that the *Meteorology* is an empirical treatise, however, it is rather surprising that Aristotle should proceed in a dialectical manner as follows. First he gathers the common opinions about a topic and reviews the difficulties connected with them; then he introduces his own hypothesis
[69] to resolve the difficulties and, thereby, saves the phenomena (340b3 ff.). In | I, 6, for example, he sets out to explain the nature of comets by giving a preliminary outline of the views of his predecessors on the subject. Next, he

reviews the major difficulties and objections which tell against all or some of these theories about comets and which show them to be false. Subsequently, in I, 7, he justifies his own explanation by the following criterion:

> We consider a satisfactory explanation of phenomena inaccessible to observation to have been given when our account of them is free from impossibilities. The phenomena available suggest the following account of the matters in question.[13]

Even though this criterion is applied specifically here to heavenly phenomena which are difficult to perceive by virtue of distance, Aristotle suggests that it can be applied generally to other phenomena that are not directly accessible to sensory observation. If that is the case then his criterion of adequate explanation is one of logical consistency between the available phenomena and the explanatory theory. But such a criterion is also applicable to other inquiries besides astronomy and meteorology; and hence this passage indirectly supports my thesis about the analogical unity of Aristotle's methodology.[14]

In fact, his general method of inquiry makes him too quick to accept apparent correlations between events as confirmations of his explanatory theories.[15] This weakness can be seen clearly in *Meteorology* I, 7, for instance, where Aristotle claims that the fiery nature of comets is confirmed by the coincidence of wind and drought with their appearance.[16] According to his theory, comets result from dry exhalations that have risen up towards the boundary of the sublunary realm and that have been ignited by friction against the nearest sphere of the heavenly bodies. So when comets are

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[13] *Meteor*. I, 7, 344a5–8, trans. Webster. Cynthia Freeland (1990) finds this passage to be so contrary to Aristotle's explanatory realism that she is inclined to treat it as an interpolation, but I do not think one can avoid its implications so easily.

[14] Leszl (1981: 319) also notes that, even in procedures for explaining empirical data, when these data are given linguistic expression they are held by Aristotle to 'accord' with each other and with hypotheses in the same way as in a strictly dialectical procedure.

[15] J.B. Skemp (1979) also finds in Aristotle a similar tendency to subordinate empirical evidence to theory, especially with regard to the existence of a fifth element and of an unmoved mover. For Skemp the outstanding example of this tendency occurs in *De Caelo* II, 7, where Aristotle introduces the analogy of missiles igniting through friction to explain how stars composed of ether can give light and how the sun gives us heat by virtue of the lowest sphere rubbing against the air at a great speed.

[16] This correlation is called a τεκμήριον of the fiery nature of comets, which means for Aristotle that there is a necessary causal relationship between the appearance of many comets and the subsequent wind and drought. His concept of a τεκμήριον is that of a necessary sign from which a syllogism can be constructed, and his favourite example is that a woman with milk must have given birth. See *Rhet*. I, 2, 1357b.

plentiful, the air through which the exhalations rise is necessarily drier and, as a result, there is drought. When they are fewer, according to Aristotle, the effect is not drought but winds that are excessive either in duration or strength. In support of his explanation, he cites the reported fact that a great wind coincided with the fall of a stone at Aegospotami, and so he thinks the wind must have been responsible for carrying it up during the night.[17] Coincidentally, he mentions that a comet had appeared in the west at the same time and so he takes his theory to be confirmed (344b30 ff.). In view of the fact that Anaxagoras (DK 59A 11, 12) had cited this event in support of his claim that heavenly bodies like the sun are fiery stones, Aristotle seems to be ignoring other possible explanations of these events. Indeed this is an example of the way in which general theoretical assumptions guide his interpretation of sensible phenomena. In any event, my brief look at the *Meteorology* shows that Aristotle makes no sharp distinction between empirical facts and common opinions about the attributes of things 'aloft'.[18]

[70] Let us now turn to *De Caelo* I, where Aristotle discusses general questions about the universe such as whether it is one or many, eternal or generated. Since I am interested chiefly in methodological issues, however, I will not consider his answers to these questions except where they illustrate a point of method. In I, 3, for instance, he canvasses some logical arguments in support of the view that the primary body (ether) is ungenerated and indestructible. Having rehearsed these, Aristotle goes on to say:

> The reasons why the primary body is eternal and not subject to increase or diminution, but unageing and unalterable and unmodified, will be clear from what has been said to anyone who believes in our assumptions. Our theory seems to confirm the phenomena and to be confirmed by them.
>
> (*De Caelo* 270b1–6, trans. Stocks)

The crucial sentence here is the last, which sums up his conception of the dual relationship between theory and phenomena. On the one hand, if one accepts the principles that have been posited then it is possible to explain the phenomena as consequences. This is what Aristotle has been

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[17] Since this event is usually dated around 467 BC Aristotle must be relying on eyewitness or hearsay reports that were well over 100 years old when he proposed his explanation.

[18] Irwin (1987: 115) concedes that Aristotle has to rely on common beliefs, tradition, and other non-perceptual appearances, when direct observation is impossible. Yet he insists that Aristotle shows himself to be well aware of the difference between perceptual and non-perceptual appearances, though convincing textual evidence for this awareness is scarce. Indeed, Irwin 116 himself admits that the distinction between perceptual appearances and common beliefs may not always be very sharp in Aristotle's practice; see *GA* 778b7–10.

doing in the previous section and that is why he mentions trust in the hypotheses (τοῖς ὑποκειμένοις) as one condition for the conclusions being accepted as obvious. On the other hand, the same conclusions may also be accepted on the grounds that the hypotheses are confirmed by the phenomena. Thus, Aristotle says, it seems that the argument bears witness to the phenomena and that the phenomena, in turn, bear witness to the argument.[19] Since the Greek construction gives only one verb (μαρτυρεῖν) to cover both aspects of this logical relationship, we may assume that he saw them as being symmetrical. In other words, he regards the deduction of phenomena from first principles and the confirmation of such principles by means of the phenomena as inversely related procedures, just like analysis and synthesis in mathematics. This suggests that the hypothetico-deductive form of explanation is being extrapolated from astronomical inquiry into more philosophical modes of reflection.[20]

We should also notice the sort of phenomena to which Aristotle subsequently appeals as bearing witness to the truth of hypothetical explanations. In support of his claim about the divinity and eternity of the primary body, he cites an almost universal opinion among Greeks and barbarians that divinity has the highest place in the universe, namely, in the heavenly bodies (*De Caelo* 270b6–10). Here the criterion of general consensus is invoked by Aristotle to show that his claims about the unchangeable ether are well (καλῶς) founded. But he also cites the evidence of the senses as being sufficient (ἱκανῶς) to convince us, at least with human certainty (270b13 ff.).[21] Given the distance of

[19] *De Caelo* 270b5–6: ἔοικε δ' ὅ τε λόγος τοῖς φαινομένοις μαρτυρεῖν καὶ τὰ φαινόμενα τῷ λόγῳ. Here Aristotle appears to be guilty either of the fallacy of affirming the consequent or of arguing in a circle. But I think that he can be cleared of such charges when we see that, whereas the principles that explain the phenomena are accepted hypothetically, the phenomena are held to be trustworthy in themselves because they are supplied from sense experience or from reputable opinions.

[20] Walter Leszl (1981: 317) makes a useful distinction between broader and narrower senses of 'hypothesis' in Aristotle. He thinks the narrower sense is connected with mathematics and dialectic, which both seem to be based on agreed assumptions as in dialectical debate; see *An. Pr.* 49b33 ff., *An. Post.* I, 10, *Met.* 1005a11–13, 1089a21. By contrast, the wider sense means any kind of first principle of knowledge or any premise of demonstrative reasoning; see *An. Post.* 81b14–15, *Met.* 1013a14–16, 1013b2021. Aristotle sometimes stresses that even demonstrative premises based on empirical evidence are hypotheses (in the broad sense) because they are still consciously postulated as a result of assenting to the evidence and of choosing an appropriate formulation. Furthermore, in explanations of empirical data, their relation to hypotheses is one of 'accord' (συμφωνεῖν) comparable to the situation in dialectic and mathematics.

[21] Even though the Greek text contains an implicit contrast between observational evidence and common opinion, it is noteworthy that both kinds of evidence are held to

heavenly bodies from us, it is not surprising that Aristotle admits sense perception to be fallible in this case, though he insists that it provides sufficient evidence for human confidence to | be placed in it. Finally, as [71] another kind of supporting evidence, he appeals to the tradition of calling the primary body *aither*, which he analyses etymologically as derived from the fact that it 'runs always' (ἀεὶ θεῖν). Whether or not this etymology[22] is correct, it shows that language is one of the relevant phenomena for Aristotle because he sees it as a repository of truth that can be drawn on by each generation. In this context, he repeats the belief that the same ideas recur to mankind again and again, presumably because they are eternally true (270b20–21). So, along with the records of astronomical observations, linguistic usage and reports of previous opinions are treated as legitimate phenomena in cosmology.

At *De Caelo* II, 5 Aristotle is engaged in the task of searching for an ultimate or a penultimate cause for heavenly bodies moving in one direction rather than another. Within this context he considers the potential objection that seeking such a proof shows a lack of *paideia*, and he replies that this depends on whether one is seeking merely human conviction or rather something unassailable. Personally, he would be grateful for more precise proofs but he is prepared to settle for what is plausible (τὸ φαινόμενον). In the absence of clear perceptual evidence about such ultimate causes, he falls back on two cosmological principles, i.e. that nature always yields the best result, and that forward motion is superior to backward motion. These principles supply the explanation which enables him to solve the puzzle (αἰτία λύει τὴν ἀπορίαν) (288a8–13). A clear parallel with dialectical inquiry is suggested by the talk of an aporia in this context, and by its resolution through an appeal to plausible cosmological hypotheses.[23]

Finally, let us briefly consider a passage from *De Caelo* II, 13 where Aristotle criticises the astronomical method of the so-called Pythagoreans. The context for his critique is provided by an inquiry into the location, motion, and shape of the earth (293a15 ff.). As usual, he begins with a review of divergent opinions about the position of the earth. Most thinkers who hold the universe to be

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be consistent with Aristotle's approach to empirical cosmology. See Oehler 1961 on the use of *consensus omnium* as a criterion of truth in ancient philosophy.

[22] Such an etymology is given also in Plato's *Cratylus* 410b, so perhaps it had some currency.

[23] Irwin (1987: 120) follows Owen in claiming that aporias in empirical inquiries will tend to be about empirical facts, whereas they are logical or philosophical puzzles in the case of dialectical inquiries. In the first case, the source of puzzles is empirical ignorance about facts or their explanation, whereas, in the second case, the presence of persuasive arguments on both sides of a question leads to dialectical puzzles.

finite think that the earth lies at the centre but the Italian philosophers known as Pythagoreans take the contrary view:

> At the centre, they say, is fire, and the earth is one of the stars, creating night and day by its circular motion about the centre. They further construct another earth in opposition to ours to which they give the name counter-earth. In all this they are not seeking for theories and causes to account for the phenomena, but rather forcing the phenomena and trying to accommodate them to certain theories and opinions of their own. (*De Caelo* II, 13, 293a21–30, trans. Stocks)

From a methodological perspective, the importance of this passage is that it contains a clear contrast between what Aristotle considers to be right and wrong ways of relating theory and phenomena in astronomical explanations. The right way is to seek explanatory accounts that conform
[72] with the | appearances (πρὸς τὰ φαινόμενα), whereas the wrong way is to drag the phenomena towards some peculiar theories or opinions (πρός τινας λόγους καὶ δόξας) in an attempt to make them fit together. For Aristotle this mistaken method of doing astronomy is exemplified by the Pythagoreans who invent (κατασκευάζουσι) a counter-earth, not to explain some observable phenomena but rather to conform with their preconceived notion about the perfection of the number ten. It seems that he regards the Pythagorean approach as anti-empirical, yet he reports on how they explained the phenomena of night and day in terms of the orbit of the earth around the central fire, which suggests that they made some appeal to observation. So we must find some other grounds for Aristotle's complaint about the a priori character of Pythagorean astronomy.

Indeed we need look no further than the subsequent passage where he reports the opinions of other thinkers who also hold that fire rather than earth ought be placed at the centre because the most honourable body should be given the most honourable place. According to Aristotle, these are people who look for confirmation (πιστόν) not from appearances (φαινομένων) but from theories or arguments (λόγων) (293a29–30). Even though he does not identify these thinkers, it is clear from the context that they are Pythagoreans because they accept an argument that gives priority in honour to fire over earth and to boundaries over what lies between bounds. But it is unclear what Aristotle finds wrong with this kind of argument or what he means by saying that these thinkers rely more on theories than on the phenomena. Perhaps this is clarified by the passage immediately following (293b2 ff.), where he reports the additional Pythagorean claim that the centre ought to be guarded because it is the most important part of the universe (τὸ κυριώτατον τοῦ παντός); so they place fire there and call it the 'Guard-house of Zeus'.

According to Aristotle's analysis, such an argument assumes that 'centre' is being used univocally for the geometrical centre and for the natural centre of the thing itself. But he finds it more plausible to assume that these centres are not identical for the world any more than they are for animals, since the natural and geometrical centres for animal bodies are not the same. Therefore, instead of worrying about a guard for the geometrical centre, the Pythagoreans should have inquired about the natural centre by asking what sort of thing it is and where it is located. In the case of an animal, for instance, Aristotle holds that the natural centre is the heart and that this is not identical with the geometrical centre. Presumably he thinks that the same holds true analogously for the universe as a whole, even though he accepts that its geometrical centre coincides with the natural place for all heavy bodies. But that central place is more like a goal for motion than a starting-point (ἀρχή) and so should not be given the priority in honour that is due to a principle (ἀρχή) (293b11–13). Therefore, somewhat paradoxically, Aristotle concludes that the circumference (τὸ περιέχον) is | the real centre [73] of the universe because it is the limit that defines the geometrical centre. Although this conclusion seems to depend on geometry, its true ground is the metaphysical maxim that the limit is more honourable (τιμιώτερον) than what is limited, since the first corresponds to the substance (οὐσία) and the second to the matter of the system (293b14–16).

From this I think it is clear that what Aristotle finds wrong with the Pythagorean argument is not the introduction of hierarchies of value *per se* but rather the use of a mathematical criterion for determining priority in honour where a metaphysical or physical criterion was more appropriate.[24] Of course, this analysis presupposes the legitimacy of Aristotle's own distinction between different sciences in terms of their subject-matter and the kinds of argument that belong to them. So we must now examine this distinction to ascertain whether it involves a radical difference in methodology and in types of phenomena for empirical as distinct from dialectical inquiries, as Irwin suggests.

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[24] *De Caelo* IV, 308a21–22, says that the circumference is prior by nature (τῇ φύσει). In *De Part. An.* 666a22 ff., with reference to the question of whether the heart is the source and receptacle for blood, Aristotle entertains the logical (λογικῶς) argument that the centre is best suited to being a source, since it is equally within reach of every part. In his discussion this sort of inference is contrasted with the kind of evidence derived from the senses, e.g. that the heart is the first thing to be set in motion in the embryos of chickens is evident from the 'experiment' of opening one egg per day from a clutch of hatching eggs.

III. *No Trespassing into Another Genus*

One might well claim that Aristotle's departmentalisation of the sciences is a rejection of some ambitious Platonic project for grounding all of the sciences on a few first principles.[25] But such a claim is uninformative at best and, at worst, misleading with respect to the way he actually proceeds when discussing the principles of the special sciences. Since Aristotle himself says that both induction and dialectic supply us with such principles, one could suppose that he has in mind two quite different sorts of inquiries. One way to decide the issue is to consider what he says about these two apparently different methods of reaching first principles in a variety of disciplines.

In *De Caelo* II, 13 Aristotle discusses among other things the question of whether the earth is in motion or at rest, and he remarks on the many different opinions people have held about it. Such diversity of opinion, he thinks, should lead everyone to puzzle (ἀπορῆσαι) about the question, since it would be a very careless mind that did not wonder (θαυμάζειν) how the whole earth can be kept aloft, given that a small part of it will not stay up without some visible support (294a12–19). This passage suggests that, when Aristotle says that philosophy begins in wonder, he could mean either the puzzlement that results from a conflict in common opinions or the surprise engendered by unexpected sensible phenomena. Within the present context, it would seem that it is the latter kind of stimulus which has led to the puzzle (τὸ ἀπορεῖν) about the stability of the earth becoming a common topic for philosophical inquiry (φιλοσόφημα). In spite of the popularity of the topic, however, Aristotle says rather sarcastically that some answers are more astounding than the puzzle itself. Having reviewed these 'solutions' together with appropriate objections, he offers the following general analysis of the shortcomings in the method of his predecessors:

> These thinkers seem to push their inquiries some way into the problem, but not so far as they might. It is what we are all inclined to do, to direct our inquiry not to the matter itself, but to the views of our opponents; for even when inquiring [74]

[25] Solmsen (1960: 260) thinks that the departmentalisation of the sciences reveals the *forma mentis* of Aristotle, as distinct from Plato. But I would suggest that perhaps one can understand how he arrived at this position through a criticism of the universalism in Plato's approach to knowledge, i.e. the assumption that a scientist must have an all-embracing knowledge of general principles or, as Speusippus held, that without knowing the whole one cannot know the part. In *De Philosophia* there is some evidence of a reaction against the 'logical' (λογικῶς) derivation of visible reality from higher principles; cf. Aristoxenus, *Harm*. II. 30–31. See also *De Part. An*. I, 1, where Aristotle distinguishes between the generally educated person and the specialist in some subject.

> on one's own one pushes the inquiry only to the point at which one can no longer offer any opposition. Hence a good inquirer will be one who is ready in bringing forward the objections proper to the genus, and that he will be when he has gained an understanding of all the differences.
>
> (*De Caelo* II, 13, 294a6–13, trans. Stocks)

This passage throws some light on Aristotle's understanding of the difference between a peirastic argument and a more scientific inquiry. A peirastic argument does not dig deeply enough into a problem because it has a tendency to stop when either the opponent or oneself has no further objections to offer.[26] By contrast, a scientific inquiry tries to bring forward all possible opinions on a question together with all the appropriate objections, so that one has a comprehensive treatment of the subject-matter covering all its differentiae. In Aristotle's own method of inquiry there are several ways by which he seeks comprehensiveness, i.e. by setting out all the logical possibilities and by gathering all the opinions on a particular topic or all the appearances related to a specific subject-matter. Having made these kinds of exhaustive surveys, he then systematically tests each possibility in his search for a first principle that will save the phenomena. This is different from the sort of *ad hominem* testing that was characteristic of Socratic dialectic, since the elenchus was complete when the opinions of one person were refuted. Here Aristotle may also have in mind the comprehensive collection of phenomena which always preceded the search for causes in astronomy. It was typical of such inquiries that they gathered all the differences belonging to a particular genus as subject-matter of science (*De Part. An.* I, 1, 639b4–14).

Another important feature of these scientific inquiries is highlighted by the care with which Aristotle distinguishes between different subject genera and their appropriate first principles. This may be seen as his reaction against the excessively 'common' method of Platonic dialectic, which tried to derive all scientific knowledge from a few general principles. Aristotle thinks that this leads the Platonists, just like the Pythagoreans, to do violence to the phenomena. We gather this much from *De Caelo* III, 7, where he considers the question of how the elements are generated. He begins the inquiry in his

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[26] Peirastic argument is described as that in which a thesis is refuted when and only when its negation is derived from the answerer's own beliefs; cf. *Soph. El.* 165b3–5. This is the kind of argument which is amply illustrated by Plato's Socratic dialogues and so it was central to Aristotle's concept of dialectic as a kind of mental gymnastics that is useful for ordinary encounters; cf. *Top.* 101a25 ff. It may also be described as 'logical' (λογικῶς), by contrast with 'physical' (φυσικῶς) inquiry, which seems to be the distinction that Aristotle has in mind in this passage; cf. *Soph. El.* 2 & 11.

typical fashion by outlining the possibilities through a review of opinions. One of these opinions clearly corresponds to the passage in the *Timaeus* which explains the generation of the so-called elements in terms of the analysis of solids into plane surfaces, and which denies that all of the elements can be transformed into each other. But Aristotle thinks that this is neither reasonable (εὔλογον) nor apparent to sense perception (φαίνεται κατὰ τὴν
[75] αἴσθησιν) because all the elements are seen to change into one | another (306a4–5).[27] Thus, even though the Platonists speak about appearances, their claims are not in agreement (μὴ ὁμολογούμενα) with the appearances. His analysis of why they fail to save the phenomena is that they have a mistaken conception of primary principles, as evidenced by their efforts to make everything conform to some predetermined beliefs.[28]

I think it is clear that Aristotle indicts them for using mathematical principles in an a priori fashion to settle a question in physics, when he goes on to say:

> It seems that perceptible things require perceptible principles, eternal things eternal principles, corruptible things corruptible principles; and, in general, every subject matter principles homogeneous with itself. But they, owing to their love for their principles, fall into the attitude of men who undertake the defence of a position in argument. In the confidence that the principles are true they are ready to accept any consequence of their application. As though some principles did not require to be judged from their results, and particularly from their final issue! And that issue, which in the case of productive knowledge is the product, in the knowledge of nature is the phenomena always and properly given by perception. (*De Caelo* III, 7, 306a10–18, trans. Stocks)

In this passage he enunciates a basic maxim of his departmentalisation of the sciences, i.e. that every subject-matter ought to have its own peculiar principles. Presumably he includes the distinction between physics and mathematics when he says that perceptible things demand perceptible principles, whereas eternal things call for eternal principles (cf. *Met*. 1026a13–16,

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[27] This passage is consistently cited (by Irwin and others) as evidence that Aristotle had two entirely different criteria of truth for dialectical and empirical inquiry. But here and in other places Aristotle appeals to both criteria in conjunction during an empirical inquiry, as if they were correlative general and specific criteria; cf. *De Part. An*. 666a22 ff. Such passages suggest that the λογικῶς/φυσικῶς distinction might be more appropriate for differentiating these two types of argument which can be given *within* any kind of inquiry.

[28] See *De Caelo* 306a26 ff., where Aristotle says that the Platonists are so eager to 'save their own hypothesis' (σώζειν τὴν ὑπόθεσιν) that they deny divisibility to some sensible bodies, even though mathematicians grant it to intelligible bodies. The point of his remark seems to be that their mistaken principles prevent them from 'saving the phenomena' for both the physical and mathematical realms.

1061b27–33, 1064a31–33, *Phys*. 198a29–31).[29] For instance, the basic assumptions of a productive science should be criticised in the light of its goal, which is a product of some sort. In the same way, Aristotle says, the goal of natural science is to explain what appears authoritatively in accordance with perception (τὸ φαινόμενον ἀεὶ κυρίως κατὰ τὴν αἴσθησιν), and so its basic principles must be judged by how well they save these phenomena. Thus, in contrast to the Platonists, he holds that the physicist cannot simply accept the consequences of a mathematical theory if these conflict with the most reliable sensible phenomena. Unfortunately, he does not here give us any criterion for judging the most authoritative (κυρίως) sensible phenomena, though one might guess that it is similar to the criterion of general consent for the most trustworthy *endoxa*.[30]

In his recent work, Terence Irwin (1987, 1988a) has cast doubt on Owen's view (1961) that universally accepted common beliefs function as firm data in a dialectical inquiry, in the same way that authoritative perceptual appearances function in empirical inquiry. Irwin's doubt rests on his claim about radical differences between these two types of inquiry which, if it were
[76] proved, would undermine my thesis about the analogical unity of Aristotle's | method. Therefore, I will briefly examine his major claims, while questioning some presuppositions on which they seem to rest.

In opposition to Nussbaum (1982, 1986), Irwin emphasises Owen's contrast between Aristotle's descriptions of empirical inquiry and of inquiry proceeding from common beliefs. As an illustration of the first, he cites the passage that I have quoted from the *Prior Analytics* where astronomy is used as a paradigm for empirical inquiry. He takes this to show that one type of appearance belongs to empirical inquiry and that an accumulation of such

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[29] In *De Part. An*. I, 1, Aristotle distinguishes between natural (φυσική) and theoretical (θεωρητική) science in terms of the mode of necessity involved in demonstrations for each kind of science. Since proofs in the former begin from what will be (τὸ ἐσόμενον), their mode of necessity will be hypothetical; whereas it will be absolute for theoretical sciences that begin from what is (τὸ ὄν) (640a1). It is noteworthy that, despite their different modes of necessity, demonstrations in both types of inquiry have the logical form of hypothetico-deductive argumentation. This suggests that Aristotle wants to retain the same general form of proof even where there are wide differences in necessity and accuracy.

[30] *Topics* VI, 4 may be relevant to this issue, since it claims that what is clear to perception is more familiar to us rather than more familiar absolutely (141b34 ff.). But Aristotle does allow that what is intelligible absolutely may coincide with what is intelligible to those in a sound intellectual condition, just as what is healthy absolutely is identical with what is healthy for those who are physically sound. I think this is similar to the ideal of the *phronimos* in ethics and politics, while the fair arbitrator is the corresponding ideal in dialectical inquiry; cf. *Met*. III, 1, 995b2–4, *EN* 1113a22–25 & 1176b24–25.

appearances provides the basis for empirical science, since it leads to the discovery of generalisations which are then used in demonstrations. By contrast, he argues, it is another type of appearance that Aristotle has in mind in *Nicomachean Ethics* VII, 1 when he talks about 'setting out the phenomena' (τιθέντας τὰ φαινόμενα) and going through the puzzles (διαπορήσαντας) because he says that, if the difficulties are resolved and the reputable beliefs (τὰ ἔνδοξα) are left standing, this is an adequate proof (δεδειγμένον) (1145b2–7). Irwin accepts Owen's claim that the appearances mentioned in this passage just are common beliefs, rather than the results of empirical inquiry and observation; so that there are two types of phenomena that belong to quite different kinds of argument and inquiry. But Irwin refuses to go along with Owen's attempt to find something common in Aristotle's procedure within the different types of inquiry to be found, for example, in the *Physics* and the *Historia Animalium*.

It should be clear by now that I side with Owen and Nussbaum in emphasising the common structure of Aristotle's methodological procedures which I hold to be derived from the method of astronomy. Indeed there is some historical precedent for this in Plato, who used a similar hypothetical method as a model for his own dialectical procedure. If Irwin is to be consistent, therefore, he must claim that Aristotle refused to accept this precedent and that he distinguished explicitly between empirical and dialectical inquiries. But the most plausible candidate for such a general distinction in Aristotle is that between inquiries conducted λογικῶς and those pursued φυσικῶς (*Phys*. 198a23, 204b4–10; *Cael*. 298b18, 304a25, *Gen. & Corr*. 316a11, *Met*. 1066b26, 1069a28, 1091a18, *EN* 1147a24). This Aristotelian distinction cuts across the boundaries of subject-matter, yet it does not divide things in the way that Irwin requires. I will return to this division after reviewing the major points of Irwin's argument.

One of Irwin's central claims is that Aristotle recognises, at least in practice if not explicitly, a sharp distinction between perceptual appearances and common beliefs, along with a corresponding distinction between types of inquiry associated with them. He insists (1987: 116; 1988a: 30–31) that there is no reason to suppose that all common beliefs, or even widely accepted common beliefs, count as perceptual appearances.[31] Conversely,

[31] Robert Bolton (1987) has also argued that the *ad hominem* element in dialectical argument excludes the possibility of its using new observational results, even those of an individual expert, because these data do not count as *endoxa* as defined at *Topics* 100b21–23. But Aristotle's definition leaves open the possibility that the view of a single expert might be

he thinks that not all perceptual appearances have to be common beliefs, as Aristotle makes clear when he claims that the result of accumulating perceptions as | preserved by memory is experience, which itself is the [77] source of appearances from which we construct a theory (*Met*. 980b28–981a1, *An. Pr*. 46a17–25, *Meteor*. 353b17–18). Irwin seems justified in claiming that for Aristotle experience is a precondition for offering a plausible theory, though not in claiming that experience is derived exclusively from perceptual appearances. While Aristotle does insist that one must have the right kind of experience before one can find the appropriate principles in any subject-matter, perceptual appearances can hardly serve as the basis for ethics, for instance, where the necessity of experience is emphasised especially by way of contrast with mathematics.[32] If we have too little experience then, while we may be able to answer all the objections raised by ourselves or others, we will not have pursued the puzzles far enough to see all the objections that arise from the subject itself (*De Caelo* 294b6–13). Thus I think that Aristotle's notion of the right sort of experience is relative to the subject matter involved, rather than to any general distinction between perceptual appearances and common beliefs.

By contrast Irwin (1987: 117) thinks that the only route to experience is through *historia*, which is the kind of empirical inquiry that grounds Aristotle's biological works. Having assumed that this sort of inquiry is the only source of experience, Irwin goes on to distinguish different types of appearance on the rather shaky grounds that Aristotle never suggests familiarity with common beliefs to be sufficient for the type of experience relevant for *historia*. He notes that this term is never applied to a survey of dialectical *endoxa* nor to any dialectical discussion, and explains this fact in terms of the close connection between *historia* and *empeiria* found at *GA* 757b35–758a3. But a different historical explanation for this linguistic connection can be given in terms of the distinction in Plato's *Phaedo* (96b ff.) between the turn to the *logoi* and the kind of inquiry pursued by the *phusiologoi*. This is at least as convincing as Irwin's explanation (1987: 117) that Aristotle does *not* suggest that the appearances discovered by *historia* thereby become common beliefs, shared by the many and the wise, because there is no reason to expect that the results of one person's inquiry are immediately

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counted as an *endoxon*, e.g. the view of Socrates on *akrasia* in *EN* VII, 1. Enrico Berti (ms) has argued for such a special use of *endoxon*.

[32] J. Donald Monan (1968: 97) has shown that Aristotle's appeal to language in the *Ethics* involves calling upon the moral experience of language users who attribute praise or blame to certain actions.

accepted by the many and the wise. This fails to explain the fact that, as Irwin concedes (118), Aristotle himself includes opinions and stories in the collection of *phainomena* that precedes many of his own physical inquiries. Irwin thinks that he does this only on the assumption that such opinions and stories record perceptual observations, but his textual evidence for this claim is weak (*Meteor*. 350a16–18). Therefore, I think that Irwin has not succeeded in showing that Aristotle relies on significantly different sorts of appearances in empirical as distinct from dialectical inquiries.

But perhaps Irwin has better grounds for his claim that Aristotle actually pursues two such different kinds of inquiry under two different descriptions. Within Aristotle's general account of a movement from things better known
[78] to us towards things that are better known by nature, Irwin finds a contrast | between two different sorts of procedure. On the one hand, there is the progress from particulars to universals that comes under the general name of 'induction' (*APr*. 68b35–37, *APost*. 71b33–72a5, *Top*. 105a16–19, 165a37).[33] Irwin (1987: 118) thinks that this description fits the kind of empirical inquiry that begins with perceptual phenomena and moves through experience to a general explanatory principle. On the other hand, Aristotle talks about a movement from the universal to particulars, since the undifferentiated whole is better known to perception, even though it is confused (*Phys*. I, 1, 184a26–b14). He illustrates this point with the example of children who call all men 'father' and all women 'mother' because they have not yet made the necessary differentiations within these two classes. So the movement towards 'particulars' involves the articulation of some essential features that a thing must have in order for a name and definition to apply to it. Irwin (1987: 119) judges this description to correspond better with dialectical inquiry that begins from common beliefs, because these correspond to a confused claim that needs to be clarified.[34] Furthermore, it seems to fit the *Topics* (100a18 ff.)

[33] But Kurt von Fritz (1964) has shown that induction in Aristotle has a wider meaning than that found in modern logic, since he uses the term for the process of bringing a particular under a universal in a dialectical situation. Irwin seems to assume that the narrow modern concept of induction also holds for Aristotle.

[34] By contrast, Bolton (1987: 127n18) reads *Physics* I, 1 as arguing that the data from which analysis starts in any physical inquiry must be perceptual data, since these fix what are the objects of which the subsequent inquiry gives a deeper understanding. In spite of the problematic nature of the whole passage, he thinks it is at least clear that what is more familiar to us is general information about the subject which we acquire by perception; cf. *Phys*. 184a24–25. With reference to this passage, Turnbull (1976) talks about 'sense universals' which are sufficiently complex to contain and confuse constituent elements, i.e. the principles or causes that are specific to the articulated species within a genus.

description of dialectical method which says that the first principles of the philosophical sciences can be examined by beginning with the common beliefs and by working through the puzzles. By contrast, he claims, the descriptions of empirical inquiry do not contain references to common beliefs and puzzles. Therefore, Irwin thinks it reasonable to conclude that the terminology of dialectic is prominent where the relevant appearances are common beliefs, whereas there is no suggestion by Aristotle that he is conducting a dialectical argument where the observational appearances are concerned. He also finds this conclusion to be supported by noticeable differences in the general character of empirical and dialectical treatises in the Corpus.

Although Irwin's proposed distinction deserves thorough scrutiny, I must here confine myself to discussing a few key texts which mix empirical and dialectical modes of inquiry, and which therefore tend to undermine his proposed distinction. Let me begin with *Generation and Corruption*, which Irwin (1988a: 29) regards as being dialectical in character. In Book I, Ch. 2, Aristotle introduces questions about generation and corruption as the main subject-matter of his inquiry, even though he also intends to discuss other kinds of change like growth and alteration. Instead of beginning with perceptual phenomena, Aristotle starts with a review of the opinions of predecessors, even though he confesses that very few of them said anything worthwhile on his topic. For instance, he claims that Plato only dealt with the generation and corruption of the elements, whereas Democritus gave serious attention to all kinds of change. In contrast to the superficial explanations (e.g. that things grow by the accretion of like to like) offered by other thinkers, the atomists hypothesised that the atoms have different shapes (σχήματα) such that generation and corruption can be explained in terms of the aggregation and segregation of atoms, while alteration is | accounted [79]
for by their arrangement and position. Aristotle explains their reasons for offering such an account as follows: 'Since they thought that the truth was in appearance and that the appearances were infinite and contrary to each other, they made the figures infinite' (*Gen. & Corr.* I, 2, 315b9–11, trans. Williams). The report that the atomists believed truth to be in appearances seems to conflict with the report of Sextus Empiricus (*Adv. Math.* VII, 135–136) that Democritus sometimes 'destroys what appears to the senses' (ἀναιρεῖ τὰ φαινόμενα ταῖς αἰσθήσεσι) and claims that none of these appears according to truth (κατ' ἀλήθειαν) but only according to opinion (κατὰ δόξαν, Frag. 9). Yet Aristotle reports elsewhere (*Met.* 1009b11–12) that Democritus held 'the appearance according to perception' (τὸ φαινόμενον κατὰ τὴν αἴσθησιν) to be necessarily true, since he assumed knowledge and perception to be

identical. While these conflicting reports are relevant to the above passage, they create a puzzle as to how it should be read.

The key to the puzzle, I think, is that Aristotle sees the method of the atomists as being akin to that of astronomers who posit certain intelligible entities in order to save the appearances which prompt and guide the search for truth. For instance, he says that they took the appearances to be infinite and so they posited an infinity of shapes for the atoms. The most obvious motivation for such an hypothesis is their effort to save perceptible phenomena. In fact, other reports by Sextus Empiricus (*Adv. Math*. vii, 136 and 138) indicate that Democritus held his atomic theory to be confirmed by 'bastard' perception, even though it was reached through the more legitimate judgment of the intellect. Furthermore, like Anaxagoras, he seems to have held that phenomena provide us with a glimpse of what is unclear to ordinary sense perception. Yet I am not concerned here with Democritus but rather with what Aristotle's remarks tell us of his own methodological views on empirical inquiry. These remarks are embedded in a review of the opinions of predecessors about generation and corruption, which Aristotle gives as an essential preamble to his own inquiry:

> So we must concentrate on these topics in our thinking; for they include a number of well-argued dilemmas. For if generation is aggregation many impossible consequences follow. But again there are compelling arguments on the other side, which is not easy to escape from, that it cannot be otherwise; and if generation is not aggregation either there is no such thing as generation at all or it is alteration—or else we must try to escape this dilemma too, difficult though it is. (*Gen*. & *Corr*. I, 2, 315b18–24, trans. Williams)

According to Irwin's proposed distinction, this passage illustrates the sort
[80] of aporia, resulting from a conflict of common opinions that is part of a |
dialectical inquiry into the nature of generation. This seems to be confirmed when Aristotle goes on to identify as the basic and decisive issue whether the primary existing things (τῶν πρώτων ὑπαρχόντων) are indivisible magnitudes, or whether nothing that has size is indivisible (315b24–28). Assuming that these entities have size, an additional question is whether they are bodies, as Democritus holds, or planes as the *Timaeus* teaches. By way of objection to the latter possibility, Aristotle says that it is unreasonable (ἄλογον) to halt the analysis at planes, and so he maintains that it is more reasonable (εὔλογον) to hold that what are indivisible are bodies, even though a great many unreasonable consequences also follow from this. If we pursue his reference to another treatment of this objection in *De Caelo* III, we find that the absurd consequences drawn from both views are primarily logical and mathematical (303a3 ff.).

However, the important point is that Aristotle considers Democritus to have given a better physical explanation because he can account for both generation and alteration in terms of the same first principles. He seems to have explained generation and corruption in terms of the aggregation (σύγκρισις) and segregation (διάκρισις) of atoms with different shapes; while alteration is accounted for in terms of a different arrangement (τάξις) and position (θέσις). For instance, Democritus denies the reality of colour because it is determined by position (τρόπῃ). By contrast, Aristotle thinks that this sort of explanation of sensible phenomena is not available to Plato because when planes are put together nothing comes into being except geometrical solids. His analysis of that sort of failed explanation is revealing:

> The cause of comparative inability to see the agreed facts as a whole is inexperience. That is why those who are more at home in physical investigations are better able to postulate the sort of principles which can connect together a wide range of data; those whom much attention to logic has diverted from study of the facts come too readily to their conclusions after viewing a few facts. One can see from this too how much difference there is between those who employ a physical and those who employ a logical mode of inquiry. Concerning the view that there are indivisibles which have size the latter say that (otherwise) the Triangle itself will be many, whilst Democritus seems to have reached his conclusions from more germane, i.e. physical, arguments.
>
> (*Gen. & Corr.* I, 2, 316a5–14, trans. Williams)

This passage seems to support Irwin's claim about a clear distinction between empirical and dialectical modes of inquiry, given its reference to questions in natural science. But, when it is taken within the whole context of this discussion, it fails to confirm Irwin's subsequent conclusion that these are two entirely different methods with their own types of phenomena.[35]

As I have already argued, Aristotle begins with a review of opinions and
[81] then mentions the presence of well-argued dilemmas as a motivation for | undertaking the inquiry here. So he is not faulting the Platonists for using

[35] In *Phys.* III, 5, Aristotle distinguishes between a more universal (καθόλου) inquiry about the existence of the infinite in intelligible objects like mathematicals and a more specific physical inquiry about sensible objects. Within this special inquiry, it is possible to consider the problem either logically (λογικῶς) or physically (φυσικῶς). From the logical considerations that Aristotle brings forward, it would seem that the first approach involves drawing out the implications that follow from definitions of body and number, for instance. By contrast, the second approach involves more physical arguments against an infinite body, e.g. that it would overpower and destroy any finite body (204b10 ff.). This passage suggests, however, that both approaches belong to the special science of physics, rather than to a more general (dialectical) inquiry.

dialectical arguments but rather for their inability to take account of *all* the agreed facts (τὰ ὁμολογούμενα), especially those which are relevant to this particular physical question about generation. He does not say that those accustomed to logical (λογικῶς) arguments fail to take account of any of the relevant facts (since that would be false, at least of Plato in the *Timaeus*) but rather that they jump to conclusions on the basis of a few observations. By contrast, those who are more accustomed to physical (φυσικῶς) inquiry are better at finding the appropriate principles that will synthesise and explain the whole range of relevant data. According to the description of astronomical method in the *Prior Analytics*, it would be correct to describe these people as having experience (ἐμπειρία), as distinct from those dialecticians who are unable to find the right principles because of inexperience (ἀπειρία). If we are to go by Aristotle's illustration in the present passage, what is wrong with the Platonic type of explanation is that it is too universal to be relevant for this particular question of generation.[36] By contrast, the explanations offered by Democritus are more at home (οἰκείοις) in physical inquiries, even if Aristotle eventually rejects them. Thus, although the atomist principles are metaphysically grounded and dialectically defended just like those of the Platonists, they are more appropriate for physical explanation because they try to save the perceptual phenomena.[37] In assessing the plausibility of the views of his predecessors about generation and corruption, Aristotle always keeps the appropriate sensible phenomena in view. For instance, in *Generation and Corruption* I, 1 (315a3–4), he says that Empedocles seems to contradict himself and also to deny the phenomena. This is a good example of the typical way in which Aristotle combines logical argumentation and sensory evidence as mutually complementary means of pursuing an inquiry into nature.

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[36] In *De Caelo* I, 10 Aristotle rejects a defence of Plato's 'generation' of an eternal universe which compares it with the diagrams drawn by mathematicians for the sake of teaching. Such a comparison is untenable for Aristotle because he sees Plato's account as involving a transition to another genus. Thus, with regard to this account in the *Timaeus*, Aristotle concludes that it has been rejected on 'physical' (φυσικῶς) grounds, but he also refers to the possibility of a 'general' (καθόλου) discussion of the issue; cf. *Met*. 987b31–33. 1069a27–28. 1078b23–29. 1087b18–21.

[37] Along with the distinction between λογικῶς and φυσικῶς (*Phys*. 264a7–8, 204b411), there is a parallel distinction between καθόλου and φυσικῶς (*De Caelo* 280a323) which strongly suggests the historical difference between a Platonic type of inquiry and the more concrete inquiry of the natural philosophers; cf. *De An*. I, 1, 403a1–2, *De Gen. An*. II, 8. 747b27–30.

IV. *Are Practical Sciences Purely Dialectical?*

I claim that this general method of saving the phenomena is applied by Aristotle to every kind of inquiry, while making due allowance for the different phenomena that are appropriate to different subject-matters. However, since many recent commentators hold that the science of ethics has a distinctive method (called 'the method of endoxa' by Barnes), I must defend my thesis about the analogical unity of Aristotle's method by examining some methodological passages from the *Eudemian* and *Nicomachean Ethics*. Although the most frequently cited passage comes from *NE* VII, 1, let us begin with a passage from *NE* VI, 8 which distinguishes between mathematics and ethics in terms of the respective sources of their principles. The general context for the passage is provided by a discussion of the relationship between practical wisdom (φρόνησις) and political science (πολιτική), both of which are said to involve the same state (ἕξις) of | knowledge, although [82] their being (εἶναι) is not the same. As usual, Aristotle begins his inquiry by gathering the relevant phenomena, some of which are things people like Euripides have said, whereas others are things that seem (δοκεῖ) to be the case. For instance, as a sign (σημεῖον) of what practical wisdom requires, he cites the fact that while young people can be clever at mathematics, it does not seem (οὐ δοκεῖ) that they become practically wise (1142a11 ff.). Whatever way one understands this piece of evidence, I think that Aristotle presents it not as a common opinion but rather as an empirical observation. This reading is supported by his subsequent logical and epistemological explanation that practical wisdom deals not only with universals but also with particulars, which become known through experience (ἐμπειρία). It is in this context that we should take Aristotle's observation that a young person lacks the sort of experience required for good judgment in practical affairs.

I think it is also significant that Aristotle assumes ethics and physics to be alike, when he considers the reasons why a boy can become a mathematician but not practically wise:

> Surely it is because mathematical objects are reached through abstraction, whereas the origins in these other cases are reached from experience. Young people then [lacking experience] have no real conviction in these other sciences, but only say the words, whereas the nature of mathematical objects is clear to them. (*EN* VI, 8.1142a18–20, trans. Irwin)

What makes physics and ethics similar in this context is that both sciences reach their appropriate first principles through experience (ἐξ ἐμπειρίας), whereas mathematics grasps its principles through abstraction (δι' ἀφαιρέσεως). Elsewhere (pp. 301–332 above) I have argued that 'abstraction'

for Aristotle is primarily a logical method of subtraction that enables the mathematician simply to posit his subject genus and to demonstrate that universal predicates belong to it. My argument is consistent with Aristotle's tendency to characterise the exclusively mathematical approach of the Pythagoreans and Platonists as a 'logical' type of inquiry, by contrast with the more 'physical' type of inquiry conducted by Democritus. But even on an epistemological interpretation, it would not be possible to line up ethics and physics on different sides of the logical/physical distinction with respect to their methods of inquiry. Just like astronomy, both sciences require extensive acquaintance with the relevant sorts of phenomena before the appropriate first principles are discovered. Contrary to Irwin, what this passage suggests is that for Aristotle both ethics and physics are empirical sciences with similar methods, despite the fact that they deal with quite different kinds of appearances.[38]

From this perspective, let me now examine the passage from *NE* VII, 1
[83] which is usually exhibited as evidence that Aristotle had in mind a different | method of inquiry for ethics. As part of his introduction to an inquiry about *akrasia* and related topics, he says the following:

> As in the other cases we must set out the appearances, and first of all go through the puzzles. In this way we must prove the common beliefs about these ways of being affected—ideally, all the common beliefs, but if not all, then most of them, and the most important. For if the objections are solved, and the common beliefs are left, it will be an adequate proof.
>
> (*EN* VII, 1, 1145b2–8, trans. Irwin)

As Barnes (1980) points out, the method of *endoxa* outlined here seems to consist of three distinct steps: (1) laying out (τιθέναι) the appearances; (2) puzzling through (διαπορεῖν) the resulting difficulties; (3) proving (δεικνύναι) the reputable opinions (τὰ ἔνδοξα). The first step clearly involves a review of the relevant phenomena, which in this case are things said (τὰ λεγόμενα) and things that seem to be the case (τὰ δοκοῦντα) about incontinence (*EN* 1145b20). For instance, it seems (δοκεῖ) that the incontinent person is one who abandons his rational calculation, whereas the continent person abides by his reasoning (1145b11–12). Now, while one might concede that this is a different sort of phenomenon from what one finds in physics or meteorology, it does not follow that they all involve different methods of inquiry. In fact,

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[38] According to Aristotle, *EN* I, 4, 1095b5–9, moral habituation provides the right sort of experience for making 'the that' (τὸ ὅτι) as a first principle obvious to the student without him needing to ask for 'the reason why' (τὸ διότι), since ethics is a practical discipline whose goal is action rather than knowledge.

the first stage of setting out the phenomena in ethical inquiry corresponds to what Aristotle describes in the *Prior Analytics* as the initial stage of any empirical inquiry. Similarly, the last stage of proving the *endoxa* can be taken to correspond with the final step of 'saving the phenomena', in which one must show that the explanatory hypothesis is confirmed by the phenomena.[39]

Thus Irwin's case rests heavily on his claim (1987: 127) that puzzles play a different role in dialectical inquiry to that in empirical inquiry, especially with reference to the testing and confirmation of a theory. Even though he concedes that the presence of puzzles does not distinguish one type of inquiry from the other, he insists that puzzle-solving is not an essential condition for the adequacy of an empirical theory as it is for a dialectical solution. In his own words, Irwin finds no reason to think that Aristotle believed authoritative perceptual appearances to lose caste if they cannot be explained by some plausible empirical theory. By contrast, the existence of dialectical puzzles represents a challenge to the truth of appearances, such that none of them can be treated as authoritative until the puzzles are resolved. If this could be documented as Aristotle's explicit view, then the unitarian thesis might be undermined, but the best that Irwin has to offer is circumstantial evidence. For example, he finds it significant that Aristotle mentions puzzle-solving only in his description of an adequate dialectical theory and not for an empirical theory. The reason, Irwin thinks, is that a legitimate empirical inquiry may still leave puzzles unresolved for
[84] the lack of | appropriate appearances, which may yet be gathered through further *historia*. Thus, for instance, Aristotle concedes that the phenomena of the heavens tend to be scarce and inaccessible, so that one must construct corrigible hypotheses from what is available. Irwin argues that no similar suggestion is made about dialectical inquiry because an exhaustive survey of its relevant appearances does not depend on empirical inquiry.[40] Yet Irwin has given no convincing reason for denying that the collection of common opinions is not a form of empirical inquiry for Aristotle.

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[39] At *EN* I, 8, 1098b9 ff. Aristotle outlines his proposed method of inquiry in ethics as follows: One must examine a first principle not only from the point of view of its logical consequences (ἐκ τοῦ συμπεράσματος) but also in the light of current opinions (ἐκ τῶν λεγομένων) because, if the principle is true, it harmonises (συνᾴδει) with all the relevant facts (τὰ ὑπάρχοντα); whereas, if it is false, it will be discordant (διαφωνεῖ) with them. The metaphors of harmony and disharmony here are reminiscent of Plato's description of the method of hypothesis in the *Phaedo*, which confined itself to internal logical consistency.

[40] But in several dialectical contexts Aristotle does suggest that his hypotheses may be corrigible, especially when he sets the modest goal of doing no worse than his predecessors; cf. *Met*. III, 1 and *De Anima* I, 1.

Furthermore, contrary to what Irwin claims, we find Aristotle giving prominence to common opinions and puzzles in connection with some empirical inquiries. In *De Caelo* IV, 1, for instance, he introduces his treatise on weight and lightness as follows:

> We must then first look at whatever others have said, and formulate the questions which require settlement in the interests of this inquiry, before we go on to state our own view of the matter.
>
> (*De Caelo* IV, 1, 308a4–8, trans. Stocks)

Although Aristotle gives no specific names, it is clear that he has in mind the opinions of predecessors such as Plato and Democritus, especially since he proceeds to examine the theory of weight outlined in the *Timaeus*. The purpose of such an examination is to review the difficulties (διαπορήσαντες) which must be resolved by the explanation that Aristotle himself will put forward. Barnes (1980) thinks that this passage ascribes a purely methodological function to the collection of *endoxa*, i.e. that it does not determine and circumscribe the area of legitimate inquiry.[41] But it is difficult to see how a collection of the relevant phenomena can fail to clarify the subject matter in question. For instance, in the treatise on weight in *De Caelo* IV, Aristotle emphasises that all previous theories are inadequate in that they deal only with relative weight and fail to define or use absolute weight as an explanatory principle (308a34 ff.). Although one is left with the general impression that the review of difficulties serves only to prepare the way for Aristotle's own account of absolute weight, yet one must not forget that this account will also have to explain the phenomena of relative weight. However, it is clear throughout the treatise on weight that sensory phenomena must be 'saved' in preference to common opinions (308b18, 309a26–27).

So there is an unanswered question about the methodological function of the reviews of common opinions usually found at the beginning of Aristotle's scientific treatises. Irwin thinks that resolving the associated puzzles is unnecessary for an adequate empirical theory, whereas it is an essential

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[41] Enrico Berti (ms) has argued that *endoxa* are the authoritative phenomena which must be 'saved' by a dialectical inquiry, and that they are not to be identified with the common beliefs which generate the puzzles. Yet there is little textual evidence for such a distinction in Aristotle, except perhaps the significant absence of the term *endoxon* in connection with the initial gathering of *legomena* which generate the puzzles in a dialectical inquiry. Thus, in *Topics* I, 1, where Aristotle says that dialectical syllogisms are made from *endoxa*, he is already talking about the way 'from' and not 'to' principles in any dialectical inquiry. This leaves open the possibility that common opinions (*doxai*) may provide the initial starting-point as things more familiar to us, rather than more familiar absolutely.

part of an adequate dialectical theory. But it seems to me that the review of opinions plays an important logical role in Aristotle's empirical inquiries, even if such opinions are not the crucial phenomena to be saved. In *De Caelo* I, 10, for instance, he introduces a treatise on the eternality of the world with a review of opinions, which he justifies as follows:

> Let us start with a review of the theories of other thinkers; for the proofs of [85]
> a theory are difficulties for the contrary theory. Besides, those who have first heard the pleas of our adversaries will be more likely to credit the assertions we are going to make. We shall be less open to the charge of procuring judgment by default. To give a satisfactory decision as to the truth it is necessary to be rather an arbitrator than a party to the dispute.
>
> (*De Caelo* I, 10, 279b6–13, trans. Stocks)

On the face of it, this passage seems to support the view that reviewing the common opinions is merely a preliminary task for Aristotle in an empirical inquiry, but I think that closer scrutiny shows something else. First, he explains that we should go through the hypotheses (ὑπολήψεις) of others because the proofs (ἀποδείξεις) of one theory constitute difficulties (ἀπορίαι) for its opposite. This explanation seems to presuppose that competing theories are related as logical contradictories (or at least as contraries) in such a way that the objections against one theory could serve as supporting evidence for another. If that is the case then the puzzles which arise from Aristotle's review of opinions can be used to confirm his own theory, especially when it resolves them in the final movement of the inquiry. The presupposition here is that one can give an exhaustive outline of logical possibilities which provides the framework, not only for the initial collection of opinions, but also for the subsequent empirical inquiry. In this light we can make sense of Aristotle's characteristic use of λογικῶς inquiry as a preliminary to φυσικῶς inquiry.

In the latter part of the above passage, Aristotle justifies his procedure in the language of forensic oratory, which explains the epistemological (rather than logical) function of a review of common opinions. He claims that the subsequent arguments will inspire greater confidence if the arguments of the disputants have already been given a fair hearing. The reason for such confidence is that the successful theory will have survived in a fair competition rather than winning by default. Continuing the forensic metaphor, Aristotle concludes that the seeker after truth must be an arbitrator rather than a litigant, presumably since the latter is too intent on winning the argument. This reminds us of his remark that the Pythagoreans and Platonists, in adopting mathematical principles of explanation for physics, are like people engaged in argument who defend their position at the cost of the truth. By

contrast, Aristotle adopts the posture of an arbitrator who seeks the truth somewhere between two competing sets of claims and arguments. According to this forensic model of inquiry, therefore, the review of common opinions substitutes for the claims and counterclaims of plaintiffs in the law courts, while the function of the inquirer is that of a good judge who finds a principle to resolve the dispute and to give each plaintiff his due. This principle is analogous to a hypothesis in his explanatory model for the natural sciences.

[86] This analogy is clearer in the *Eudemian Ethics* where, as Allan (1961) has argued, there are some traces of a quasi-mathematical method in Aristotle's procedure, even though he pays close attention to the facts of moral experience. In discussing competing views of human happiness in relation to virtue and wisdom, Aristotle offers his methodological manifesto:

> We must try, by argument, to reach a convincing conclusion on all these questions, using, as testimony and by way of example, what appears to be the case. For it would be best if everyone should turn out to agree with what we are going to say; if not that, that they should all agree in a way and will agree after a change of mind; for each man has something of his own to contribute to the finding of the truth, and it is from such [starting-points] that we must demonstrate: beginning with things that are correctly said, but not clearly, as we proceed we shall come to express them clearly, with what is more perspicuous at each stage superseding what is customarily expressed in a confused fashion. (*EE* I, 6, 1216b26–35, trans. Woods)

In order to grasp the significance of this passage, we must read it in the context of Aristotle's previous distinction between theoretical, productive, and practical sciences in terms of their goals. Since this distinction was made by way of response to the excessive intellectualism of Socrates in ethical matters, there can be no question of Aristotle's own method being based on a confusion between theory and praxis as the ultimate goal of ethical inquiry. So we must keep in mind what he says elsewhere about 'the fact' (τὸ ὅτι) being adequate as a first principle in ethics, since that is sufficient as a principle of action for a person with the right habits. In the above methodological passage, however, Aristotle appears to be speaking at a higher philosophical level of reflection which emphasises the truth of the conclusions more than their persuasiveness as principles of action. This is confirmed by the subsequent passage (1216b35ff.), which distinguishes between a philosophical and a non-philosophical approach in every discipline. Aristotle insists that the politician should not disregard as irrelevant a philosophical inquiry about the cause (τὸ διότι), over and above an inquiry about the fact. Such an inquiry is necessary for the politician if he is not to be taken in by those sophists who talk like philosophers about politics but who, in fact, use irrelevant

(ἀλλοτρίους) and empty (κενούς) words. Strangely enough, the politician is duped not through lack of experience in politics but through lack of education (ἀπαιδευσία), which renders him unable to distinguish between arguments that are appropriate (οἰκείους) to the subject-matter and those which are foreign (ἀλλοτρίους) to it. Obviously Aristotle is referring to the notorious success which rhetoricians enjoyed in the Athenian democracy, even though they knew little about political matters. According to him, one way to guard against such charlatans is to test the | arguments against the [87] appearances (φαινομένοις). For this purpose, it is useful to distinguish between the account given of the cause and the conclusion drawn from it, since the conclusion may be true but not for the reason given, as Aristotle shows in his *Analytics*. The reference to the *Analytics* is very revealing because it shows that he has the demonstrative model in mind here, when he distinguishes between the account given of the principle and what is deduced from it.

Within such a framework, I suggest that the above methodological passage is primarily concerned with the way 'to' the first principles of ethical and political science. From this point of view, it makes sense for him to say that he is seeking something convincing by means of argument, while using the phenomena both as evidence and as examples. These anchor the argument in the reality of ethical and political experience, and thereby prevent it from becoming irrelevant and empty. Here Aristotle is seeking the right balance between λογικῶς and φυσικῶς types of inquiry, both of which are deemed necessary for a comprehensive treatment of the subject-matter. Furthermore, *consensus omnium* remains his ideal criterion of truth, though he is prepared to settle for qualified agreement as a result of some dialectical persuasion. Behind this ideal lies Aristotle's deep conviction about the human capacity for truth which is the real ground for the possibility of scientific inquiry. As he puts it himself, we begin from things that are true but unclear and proceed to principles that are both clear and true; so that we can use these as premises in constructing our demonstrations. Indeed, one may spy here an implicit parallel between the progress of an individual towards knowledge and the development of a whole field through a tradition of inquiry in which someone made the all-important start, though it was still unclear, while subsequent thinkers (like Aristotle) reached clear first principles and completed the science.

Finally, a brief look at a passage from the *Eudemian Ethics* which makes some methodological remarks that parallel those we have examined from the *Nicomachean Ethics*. The passage, which finds its context within a general discussion of friendship, goes as follows:

> We must, then, find a method that will best explain the views held on these topics, and also put an end to difficulties and contradictions. And this will happen if the contrary views are seen to be held with some show of reason; such a view will be most in harmony with the phenomena; and both the contradictory statements will in the end stand, if what is said is true in one sense but untrue in another. (*EE* VII, 2, 1235b13–18, trans. Solomon)

From the methodological point of view, perhaps the most noteworthy thing here is that φαινόμενα and δοκοῦντα seem to be used interchangeably to characterise the *endoxa* from which the inquiry into friendship begins. This
[88] seems to suggest that Aristotle saw the method of ethical inquiry as being | similar to that of any empirical inquiry, including that of astronomy. Of course, if we attach importance to terminology, we must explain why the corresponding discussion of friendship in *Nicomachean Ethics* VIII does not use the term φαινόμενα. But perhaps it is more important to note that the whole description of ethical method given in the above passage corresponds perfectly to the procedure of the treatise on action and passion in *Generation and Corruption* I, 7. In both cases we begin with phenomena that seem to conflict and so give rise to puzzles, which must be solved by some explanatory principle that shows most of the phenomena to be well founded and, hence, not really conflicting. Thus, in contrast to what Irwin claims, there is little convincing textual evidence that Aristotle saw the method of ethical inquiry as being different in kind from that of more empirical types of inquiry.

Conclusion: The Cyclical Return of Truth

From our modern perspective it is difficult to understand how Aristotle could have failed to see the difference between the methods of different types of inquiry, especially since he distinguishes them in terms of subject matter and even warns us against expecting the same kind of precision in ethical inquiry as one finds in mathematics. But for him the degree of precision to be sought in a science is decided by the complexity of its subject matter rather than by any difference in its method of inquiry. For instance, astronomy is less exact than geometry, even though both use a mathematical method, because astronomy must deal with the additional physical aspects of the heavenly bodies. So the distinction between these two related sciences illustrates the difference between logical and physical modes of inquiry, but not Irwin's distinction between dialectical and empirical kinds of inquiry.

Yet it would be legitimate for someone to object that I have not given any solid Aristotelian evidence for ruling out the *possibility* of the latter

kind of distinction. Perhaps the best that one can do is to point towards some scattered hints that Aristotle held some views about the cyclical return of truth which would undercut Irwin's distinction between empirical and dialectical inquiry. For instance, his *Politics* combines historical research into the constitutions of Greek cities with dialectical reviews of common opinions about the best political order. In Aristotle's mind these represent merely two avenues to a single set of truths that have already been discovered and forgotten many times by previous generations (*Pol.* 1264a1–4, 1329b25–30). I have already noted that he often appeals to this myth of eternal return, as if he finds truth in it (*De Caelo* 270b19 ff., *Met.* 1074b10–13, *De Phil.* Frag. 8, Ross, *Protr.* Frag. 8, Ross). The grounds for his confidence in the truth of the myth seem to be the related axioms that mankind has a natural inclination towards the truth and that nature does nothing in vain (*Met.* 980a21, 993a30–b4, *EN* 1143b6–9, *EE* 1212b26–36, *Rhet.* 1355a15–18). | So if no thinker before [89]
Aristotle had hit upon the truth of things in some way, this would involve a systematic frustration of the purposes of nature which he could hardly credit. Besides, his method of reviewing the common opinions is grounded on the assumption that previous thinkers had some grasp of the truth, even if they were not entirely clear about it (cf. *EE* 1216b32–34, *Pol.* 1280a9). This means that he sees scientific problems and their possible solutions as being defined by the tradition of inquiry in each field, whether this be politics, physics or philosophy. Even with reference to the science of astronomy where both observations and theories remain uncertain, Aristotle seems confident that the Egyptians and the Babylonians have discovered the truth already and that human ingenuity will recover it.

[3]

ARISTOTLE'S CRITICISM OF PLATO'S THEORY OF FORM NUMBERS

Introduction

Despite the apparent precision of mathematics, we face the same hermeneutical problems in the history of mathematics as in the history of philosophy or of any other scientific discipline. In fact, the close links which have always existed between mathematics and philosophy make it more likely that any hermeneutical difficulties we encounter in philosophy will be reflected in the history of mathematics. This is nicely illustrated by the scholarly dispute about whether Plato discovered an 'advanced' concept of number which was not properly understood by any of his followers in the Academy, and which was therefore improperly criticised by Aristotle.[1] Some scholars such as Cherniss (1944 & 1945) and Tarán (1978) reject the criticisms offered by Aristotle as based largely on misunderstanding, whereas others such as Burnyeat (1987) and Pritchard (1995) think that Aristotle has correctly understood the Platonic theory of Form Numbers, even if he shows little sympathy for it. What makes it very difficult to adjudicate on this scholarly dispute is our inevitable tendency to understand the Greek concept of number as an anticipation of some modern concept, even though there is no consensus among modern philosophers of mathematics on what number is.[2] But perhaps Aristotle found himself in an analogous hermeneutical situation when he was forced to interpret vague hints in the Platonic dialogues with reference to what he calls the 'unwritten doctrines'.[3]

If we confine our attention to the dialogues, it would seem that Plato had a relatively simple theory of unique Form Numbers which are multiply

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[1] Since Plato himself was not a creative mathematician, it is prima facie unlikely that he could have made a discovery in number theory that remained inaccessible to his contemporaries, including such leading mathematicians as Theaetetus and Eudoxus.

[2] See Benacerraf 1965 for a good survey of modern disputes about the nature of number. Pritchard (1995, ch. 4) has analysed some modern misunderstandings of the ancient concepts of number.

[3] It is a significant indication of our hermeneutical difficulties in discovering the 'unwritten doctrines' (ἄγραφα δόγματα) that the term was introduced as common usage by Aristotle *Phys*. 209b14–15, while he is also our primary source for reports about this hidden Academic tradition.

instantiated in the sensible world as numbers of countable things. But this straightforward view is complicated considerably by reports of 'unwritten doctrines' and by Aristotle's criticism of putative Platonic views that are not always to be found in the dialogues. For instance, he reports that the Platonists also posited intermediate mathematical numbers, which are separate from both sensible things and from the Forms. A few scholars regard this elaboration as being both inaccurate and unnecessary, but most have accepted it as being necessary if Plato is to explain how arithmetical operations like addition and multiplication are to be carried out.[4] [4]

Even more controversially, however, Aristotle has criticised a purportedly Platonic theory of Form Numbers which are constituted from units that are internally comparable within each number but externally non-comparable. Given the absence of supporting evidence from Plato's dialogues, most scholars have remained doubtful about the accuracy of Aristotle's report, while some people like Cherniss are convinced of its wrongheadedness. But, rather than survey competing scholarly opinions, I find it more fruitful to pursue the philosophical problem about the unity of number through selected texts from Plato and Aristotle, in an attempt to discover and make sense of their respective solutions. This approach may incidentally provide another perspective on the scholarly debate between the accusers and defenders of Aristotle as a critic of Plato.

At the outset it might prove helpful to reflect briefly on the typically Greek conception of number to be found in the Pythagorean tradition and in Euclid's *Elements*. In other words, what did *arithmos* mean in ordinary Greek? As far back as Homer it seems to have referred to counting the number of any denumerable group, whether that be ships in a fleet or soldiers in battle array (see *Od*. IV. 411, 450–451; XVI. 245).[5] Such linguistic evidence suggests that *arithmos* meant primarily a denumerable group, rather than a number property. It would appear that the older acrophonic system of Attic numerals favoured the concept of a numbered group or cardinal, whereas the introduction of the alphabetical system of numbering around 400 BC made it at least possible to conceive of numbers as ordinals, since the series of letters

[4] See Wedberg 1955 for the standard account of Plato's theory of Intermediates.

[5] See LSJ sv. ἀριθμέω, ἀριθμάω. Verbs of this type are usually derived from the noun. In light of Plato's report, *Rep*. 522d, of the myth about Palamedes being the inventor of number for the art of war, perhaps it is significant that much of Homer's use of counting terms is connected with the marshalling of soldiers. Philologically, it is possible that the noun *arithmos* may be derived from the same root as the noun denoting the war god, Ares, which originally may have referred to the gathering together of hostile multitudes. Such semantics would tend to favour the cardinal over the ordinal sense of number.

[5] in the Greek alphabet was used to represent the series of | natural integers.[6] Given that the alphabet itself is internally ordered, this was more suitable for representing ordinal numbers. Yet the definition of number given in Euclid's *Elements* VII may be taken to reflect the Pythagorean conception of number as a collection of units, where units are represented by pebbles and each whole number has some characteristic shape, whether that be triangular, square or oblong.[7] In Euclid, however, the numbers are represented as lines for the sake of greater generality in theoretical proofs, which were probably unknown to the earlier Pythagoreans. In any case, the predominant conception of number both in the Pythagorean and Euclidean traditions is that of a cardinal rather than an ordinal.[8] This may be important to keep in mind for assessing the originality of Plato's conception of number by contrast with that of Aristotle.

I. *Plato's Conception of Number*

Given the central importance of mathematics in Plato's philosophy, it would be very surprising if mathematical concepts such as those for numbers[9] did not qualify as Forms along with courage, beauty and man. In fact, at *Phaedo* 101b–c Plato implies that, just as for beauty and equality, there will be Forms of numbers which cause particular numbers to come into being.

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[6] See the rather neglected essays by Marcus Tod, published between 1913 and 1954, which have been reprinted as a collection by Ares Publishers, 1979. See also Ifrah 2000: 182–185, 227–233 on the older acrophonic system as distinct from the alphabetic system of numerals. The acrophonic system was only suitable for representing cardinal numbers, and was used mainly to record weights, measures and sums of money. At first, ordinal numbers were written out fully as number words, but sometime around the end of the fifth century BC the system of alphabet numerals was used to symbolise these numbers.

[7] A fragment of Epicharmus DK 23B2 provides evidence for the use of pebbles to represent numbers, and Aristotle (*Met*. 1092b8–15) refers to Eurytus, as trying to define some natural thing like a man in terms of number by using pebbles to outline a human figure. In addition, some Greek proverbs seem to identify the art of numbering with the counting of pebbles (cf. Pindar, *Odes* 2.98, 13.46). See Burkert 1972: 427 ff. on Pythagorean arithmetic and its representation of numbers by patterns of pebbles. Later Neo-Pythagoreans, such as Iamblichus and Nicomachus, describe number variously as a 'collection of units' (μονάδων σύστημα) or as a 'defined multitude' (πλῆθος ὡρισμένον).

[8] I am *not* referring to Cantor's distinction (1955: 85 ff.) between cardinal and ordinal numbers, which is very different from the more primitive distinction between regarding the number 6, for instance, as a collection of objects (sextet) and treating it as the sixth number in a count, using letters of the Greek alphabet as counters.

[9] In fact, Aristotle reports that Plato denied the existence of a universal Form of Number, since there cannot be a single Form for a series of Forms that are arranged as prior and posterior. See *EN* 1096a17 ff., *EE* 1218a1 ff. This clearly implies that Plato posited a series of Form Numbers.

What he explicitly rejects here is the common assumption that the [6]
generation of particular numbers can be explained in terms of adding, subtracting or dividing, which was presumably a typical Greek view of the process (*Phd*. 96e–97b). Instead, Plato holds that the number two is generated by participating in Twoness, just as one comes to be by participating in Oneness (*Phd*. 101c3–6). On the face of it this claim appears to be fairly straightforward, yet there are difficulties lurking beneath the surface. For instance, in talking about particular ones or twos, it seems clear that Plato has in mind concrete particulars which are counted in ones or twos, but it remains unclear whether the Form of Two, for instance, is a collection of two ideal units or whether it is simply Twoness, i.e. the universal attribute which Plato has posited as an independent ideal entity.[10]

Thus, from our modern logical perspective, there appears to be an ambiguity in Plato's conception of Form Numbers, which may be regarded either as attributes (intensional) or as classes (extensional). While the Platonic Form of any number is obviously a One over Many, its type of unity remains unclear. In modern logic there is a distinction between attributes (qualities, properties and relations) and classes, which is made on the basis that the latter are subject to a principle of extensionality, but not the former. In effect, whereas non-identical attributes may inhere in exactly the same things, two classes with the same elements must be identical.

According to Cantor, a class is a collection of a number of objects, whereas an attribute is a principle according to which such a collection is made, or by which the collected objects are chosen. Now sometimes Plato treats Forms as though they were principles (or causes) by means of which particulars are gathered into collections, rather than as being themselves collections (*Phdr* 249b–c, 265d–e). He also speaks of Forms as 'monads' or entities not compounded out of parts (see *Phil*. 15a–b, *Phd* 78b–e). Yet, on the other hand, Plato also speaks of the Form-species as being 'part' of the Form-genus, which makes the latter look more like a class than an attribute. In general, however, Platonic Forms look more like modern attributes than classes, e.g. the Form X seems to be just the attribute X itself, so that to 'participate' in X is like having

[10] John Findlay (1974) was convinced that Plato did not think of numerical *Eidê* like Duality as instances of themselves, since he denies that Duality has two members or is a case of Twoness. Significantly enough, Findlay gave no exact references to any passages in the dialogues where Plato makes such an explicit denial. Indeed, Findlay (1974: 56–57) himself seemed to be making some anachronistic assumptions when he accused Aristotle of having failed to understand Plato's higher-order thought, which he claimed can be explicated by means of set theory in modern mathematics.

that attribute. But Plato frustrates our desire for logical tidiness by assuming that the Form X is itself an X, which implies that every Form is predicated of
[7] itself, and hence that the Form of | Twoness is itself two.[11] In addition, he often speaks of the Form as an archetype (or ideal standard) which is copied or imitated by the participants.[12] Such language tends to suggest an extensional concept of Forms.

In order to explore this ambiguity, let us now consider some discussions of eidetic number in Plato. At *Hippias Major* 300a–302b he contrasts the sort of 'common thing' (κοινόν) that belongs to a whole group, as well as to every thing in the group, with the sort of *koinon* which belongs to a group of several things but not to each of these by itself. The problem of conceiving number as a *koinon* is formulated roughly as follows at *Hipp. Ma.* 301d: each of us is one, but that very thing which each of us is and both of us are not; for we are not one but two. Both together make an even number, while each separately is odd (see also *Phd* 103 ff.). This domain of common things can be defined within the mathematical realm, and numbers especially have this curious *koinon* character: every number of things belongs to these things only in respect to their community, while each single thing taken by itself is one.[13]

Jacob Klein (1968) insists that understanding the special *koinon* character of number is of crucial importance for solving the basic Platonic problem of 'community of kinds'. Klein (89) claims that Plato's solution involves the *arithmos* structure of the genera, i.e. the division of the whole realm of *eidê* into single groups or assemblages such that each *eidos*, representing a unique eidetic 'unit' (ἑνάς, *Phil.* 15a–b), can be 'thrown together' (συμβάλλειν) with other ideas of the same assemblage but not with the ideas of other assemblages. Thus the *eidê* constitute assemblages of monads, namely, *arithmoi* of a peculiar kind. The units of which the assemblages consist are

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[11] See *Prt.* 330c, *Phd* 74b–d, 100c, *Hp. Ma.* 289c, 291e, 292e, 294a–b, *Lys.* 217a, *Symp.* 210e–211d. This feature is what Gregory Vlastos has called 'Pauline predication', thereby giving rise to a whole academic industry on the question of the self-predication of Platonic Forms (Vlastos 1974 & 1969). *Pace* Cherniss, Vlastos finds no evidence in later Platonic dialogues that Plato ever consciously rejected the assumption that the Form corresponding to a given character itself has that character, e.g. that Being itself must have being or that Rest itself must be at rest. Of course, in the *Sophist*, he denies that Not-Being itself has non-being (absolutely) because otherwise it would cease to be one of the highest genera. However, the fact that he struggles to define Not-Being in terms of Otherness or Difference shows that self-predication is still taken to be normal for Forms.

[12] See *Rep.* 402c, 472c–d, 484c–d, 500e–501c, 510a–b, 520c, 540a–b, *Phdr* 250a–b, 251a, *Tim.* 29b–c, 30c–d, 37c–e, 39d–e, 48e–49a, 50c, 52c, 92c.

[13] See *Rep.* 524b, *Theaet.* 185b–d, 203d, *Phd* 96e–97a, 101b–c, *Parm.* 143c–d, *Soph.* 243d–e.

not mathematical monads, since the latter are completely similar and so can all be 'thrown together' indiscriminately (συμβληταὶ καὶ ἀδιάφοροι, *Met*. XII, 7, 1081a5). While the numbers with which the arithmetician deals are capable of being counted up, the assemblages of *eidê* cannot enter into any and every 'community' with one another. Their 'monads' | are all of different [8] kinds and can only partially be brought together, insofar as they happen to belong to one and the same assemblage, whereas insofar as they are entirely bounded off from one another, they are incapable of being thrown together, i.e. incomparable (ἀσύμβλητοι). This is a brief outline of Klein's controversial attempt to discover in Plato's dialogues an evidential source for Aristotle's report about the so-called *asumbletoi arithmoi*. Later I will outline the Aristotelian account of these strange entities, while keeping in mind the fact that at *Met*. 1055a6–7 Aristotle uses the term *asumbletos* with regard to genera that cannot be combined, just as Plato uses *sumbletos* at *Soph*. 253d with regard to genera of being that may be combined in a single *logos*.

Theaetetus 202e–205e discusses how a whole combined from given elements is related to the elements entering into that combination. The general topic being broached for discussion here is the third definition of knowledge as true judgment with an account. Socrates expands on this definition by reporting a dream which involves the central claim that there is an epistemological asymmetry between elements and complexes, i.e. elements are unknowable, while complexes are knowable.[14] The resulting dilemma may be seen as highlighting the faulty premise on which both horns depend, i.e. the identification of a whole with its constituent parts. Taking letters and syllables as examples, the dilemma begins from the question of whether a syllable is the same as its letters, or whether it is 'some single form' resulting from the combination of letters (203e4).

First horn: assuming that a syllable is in fact the same as its letters, Socrates argues that if (as the dream theorist has it) we know the syllable SO then we know the two letters also. Each letter is just as knowable as the syllable. At *Theaet*. 203e2–204a8 the second horn of the dilemma assumes that the syllable is not identical with the letters, but rather is some form having its own single nature, which is something different from the letters. Given that the complex is a single form resulting from the combination of several elements

[14] I have borrowed some of my terminology from Verity Harte 2002, and I am also indebted to her analysis, which is in turn indebted to Myles Burnyeat's comments (1990: 188–198) on the relevant passages in the *Theaetetus*.

fitted together, then it follows that the complex (e.g. syllable) must have no parts, because when a thing has parts, the whole is necessarily all the parts.

When this identification of a whole with its parts is applied specifically to number, it leads to the generalisation that for all things made up of number, all of it is the same as all of them. Thus composition is identity, and such a link between composition and number is based on the ancient notion of *arithmos*: (1) An *arithmos*, such as the sextet, is a leading example of a composite and
[9] this is consistent with the Greek notion of *arithmos* as a collection | of units. (2) The claim that for every composite its *arithmos* simply is (the same as) its parts can be explained in terms of the Greek concept of *arithmos*, i.e. small collections of units make up larger collections, e.g. trio combined with duet makes quintet.

The upshot of the aporetic discussion is that (a) if the combination of certain elements is simply all these elements, then the combination will have any characteristic which all the elements have; whereas (b) if the combination is a single form, then the combination is completely devoid of parts; and specifically its elements are not parts of it. If this were to be applied generally to the distinction between Forms and particulars, it would imply that a Form is (1) either all the particulars belonging to the scope of the Form, (2) or a single entity devoid of parts, and in the latter case the words *eidos* and *idea* would involve an intensional conception of Forms (see *Theaet*. 203e).[15] Elsewhere, however, an extensional concept seems to be implied by the Platonic thesis that every Form participates in itself, e.g. Beauty is beautiful, Twoness is two.

Let me now turn to *Republic* 525d–e where, within the context of a general discussion of the usefulness of arithmetic for turning the soul towards the reality of being, Plato emphasises the special character of the unit and of the numbers studied by mathematicians, who are said to resist any attempt to divide the unit, so as to ensure that it will always be treated as a single unit. It is clear that such units are different from the units of popular or applied arithmetic in being completely equal to each other and undifferentiated both internally and externally. What remains unclear is whether Plato is referring to mathematical numbers, which are collections of undifferentiated units, or to Form Numbers which are themselves simple monads. All that

[15] Concerning the well-known problem about the absence of Forms from the *Theaetetus*, I favour the view of Cornford, most recently defended by Adalier 2001, that the dialogue illustrates the difficulties of explaining any knowledge, such as grammar or arithmetic, without the Platonic theory of Forms.

he says (526a–b) is that the mathematicians are talking about numbers that can only be grasped by thought and which turn the soul towards the intelligible realm. Previously (524b), Plato had described how the soul calls upon calculation and understanding in trying to determine whether each of the things announced to the soul is one or two. In this way the soul is drawn towards the intelligible realm, given that the senses prove to be confusing on this question. Thus the soul will ask what the one itself is, and the resulting discipline of arithmetic leads it towards being. But since what is true of the one will be true of all numbers, then arithmetic, which is concerned with numbers, will lead the soul towards truth. So this whole passage seems to be talking about mathematical numbers rather than Form Numbers, which would presumably be studied by dialectic.

There has been much controversy over Aristotle's attribution of Intermediate mathematical objects to Plato, due to lack of evidence in the dialogues. Some scholars[16] have accused Aristotle of foisting a mistaken construction on Plato, while others[17] have discovered a Platonic rationale for the tripartite division into Forms, Intermediates and sensible things. Following the lead of Julia Annas, the most promising approach is to identify the basic problem for which the Intermediates is supposed to provide the solution. She thinks it is a reasonable conjecture that Aristotle takes Plato's argument for Intermediates as an attempted solution to the so-called 'uniqueness problem', given that the following is the only argument for their existence that can be extracted from his evidence: since Form Numbers are unique, when we add 2 + 2 = 4, for instance, we cannot be talking about either Form Numbers or sensible numbers; so there must be a third kind of number, distinct from numbered groups and from Forms. Furthermore, Aristotle's objections suggest that the Platonists gave no independent rationale for intermediate numbers other than solving the uniqueness problem for Form Numbers. [10]

But the difficulty for modern interpreters is that such a problem is hard to find in Plato's dialogues as a possible rationale for Intermediates. The relevant passages in the *Republic* (509d–511a, 523c–526b) and *Philebus* (56c–59d, 61d) do not contain the line of argument for Intermediates which is suggested by Aristotle as an answer to the Uniqueness problem. Instead, as Annas admits, Plato seems to focus on the arbitrariness of number-ascription. For instance,

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[16] Among scholars who reject Aristotle's testimony as wrong, misleading or confused, the most influential has been Cherniss 1945: 75–78.

[17] Scholars who accept Aristotle's evidence that Plato held his doctrine of Intermediates include L. Robin 1908: 199–221, 260, 266; K. Gaiser 1963: 89–106; A. Wedberg 1955, chs. 4 & 5, App. A–D; J.N. Findlay 1974: 56; P. Merlan 1960.

Republic 525c–526b discusses the way mathematicians refuse to divide their unit. Their numbers are such that in them the one is always 'equal every one to every one', having no difference and no parts, and thus is grasped only by pure thought. In the *Philebus* popular arithmetic is contrasted with that of the philosopher; while it counts with unequal units, he will deal only with units that are all exactly equal and that do not differ from the others in the slightest (56d9–e3). But actual physical objects are unsuitable as units because they are both dissimilar and divisible. So, depending on what unit we choose, we may end up with different numbers or we can 'divide' an original unit into many by counting its parts. This makes our ascriptions of number appear arbitrary and subjective. Annas (162) thinks that this line of argument concerns counting and numbers, and has no obvious application to geometry, even though the *Philebus* explicitly says that the same applies to
[11] geometry. Furthermore, in the arguments of | the *Republic* and the *Philebus*, the emphasis is placed on establishing the existence of units and numbers over and above the ordinary objects of counting; so it is their ideal nature rather than their multiplicity which is stressed. Similarly, in his extensive critique in *Metaphysics* XIII, Aristotle underlines the ideal and 'separate' character of Plato's mathematical numbers and of the units in them.

However, despite Aristotle's criticism, Dougal Blyth (2000) argues that a properly Platonic theory of the nature of number is still viable today. He appeals to *Parmenides* 143a–144a as evidence that the capacity to count is demonstrated, and used by Plato to justify the existence of numbers which are essentially ordinal, i.e. a sequence of forms differentiated by position in sequence so as to constitute the natural integers. On this basis, Blyth defends a Platonic distinction between Form Numbers as ordinals and mathematical (intermediate) numbers as cardinal. He then tries to establish the continuing viability of Plato's theory of number by relating it to modern set-theoretical approaches to number. Furthermore, he rejects the standard objections that such a concept of number was not available in antiquity and that it is inconsistent with what Aristotle reports about Platonic Form Numbers.

But the *Parmenides* passage cited by Blyth does not support his claim that Plato's conception of number is essentially ordinal, and indeed it is even misleading to refer to that passage for the generation of the number series. In brief, the argument is based on the distinctions between the terms 'one', 'being', and 'difference', which Parmenides has extracted from his analysis of 'one being' in order to show that it is unlimited in multitude. If we take any pair of these terms, he argues, we can refer to them as 'both', even though each member of the pair is 'one', and so we have the number two. Similarly, we have the number three if we add another term to the pair of terms. In the

same way, from the initial 'one being', we can generate an infinite plurality of number through multiplying by two and by three. It must have been obvious to Plato that one cannot generate the complete number series in this way, since the prime numbers are not multiples of two or of three. In fact, however, the ordinal character of numbers is not essential to his argument, since he simply wants to establish that an infinite plurality can be generated from the initial one, and thus it is more plausible to interpret his talk of number in terms of cardinals. At *Parmenides* 144a it is noteworthy that he emphasises the multiplicity of numbers, but does not consider the unity of any particular number, except in terms of its relationship to the one as a constituent part.

II. *Aristotle's Criticism of Form Numbers* [12]

In this section I will explore Aristotle's dialectical approach of canvassing all the logically possible views about Form Numbers, including a view that he says no one had espoused. This leads one to wonder whether he has accurately represented Plato's view about Form Numbers by describing their constituent units as internally comparable but externally non-comparable. I will suggest that Aristotle uses the reputedly non-espoused view as a stalking horse against Plato's Form Numbers because he thinks that absurd implications follow from that view, even if Plato did not hold it.[18] My conjecture is that Aristotle attributes the second view to Plato because, even though Forms are unique and separate, they are taken to be applicable to Greek arithmetic as commonly understood.

Thus my general strategy is to examine some of Aristotle's major objections against both the first and second views, so as to discover the presuppositions about numbers that he adopts in criticising Plato's theory of Form Numbers. For instance, just like Euclid (VII, def. 2),[19] Aristotle seems to assume that *arithmos* always involves a collection of some definite units. But modern scholars have rejected that assumption about Form Numbers on the grounds that they are not composed of units but rather correspond to numerical

[18] Blyth 2000: 33 suggests that this view contains significant elements of what he regards as the true Platonic theory of Form Numbers, i.e. that numbers are essentially a series of unique Forms that are not subject to arithmetical operations. Blyth suspects that Aristotle has either misunderstood or else deliberately ignored the true sense of the terms '*monas*' and '*asumbletos*' in Plato's theory, i.e. *monas* refers to unique Form Numbers which are non-comparable with each other and hence are not objects of arithmetic at all.

[19] Euclid's *Elements* VII, def. 2: Number is a multitude composed of monads (ἀριθμὸς τὸ ἐκ μονάδων συγκείμενον πλῆθος).

predicates, such as Twoness and Threeness. In addition, these scholars claim that Form Numbers are absolutely simple[20] and are related to each other as prior and posterior in a series. Therefore, arithmetical operations like addition and multiplication cannot be applied to Form Numbers, which are non-combinable.

However, as we have already seen, the evidence from the dialogues is ambiguous, e.g. the *Phaedo* seems to treat the Form Two as being composed of two units, while Plato himself nowhere explicitly describes Form Numbers as being merely a series of simple monads that are related to each other only as prior and posterior. Furthermore, even though Aristotle does recognise the priority and posteriority of Form Numbers, he does not think this is
[13] incompatible with their being composed from pure units. What it | does imply, according to his analysis, is that the units within each Form Number are not comparable with those within other Form Numbers. It is important to notice that, while Aristotle often speaks about non-comparable units, he rarely talks about non-comparable numbers, though he does say that they are different in kind (*Met*. 1080a17–18). According to Aristotle, things which are non-comparable have nothing in common because they do not belong to the same genus (*Met*. 1055a6–7). This is consistent with his reports elsewhere that Plato did not posit any genus for number because numbers are related to each other as prior and posterior. By contrast, monads which are comparable are undifferentiated (ἀδιάφοροι) or wholly equivalent for the purposes of counting (*Met*. 1082a4–6, 1083a4–8).

The philosophical point that underlies this dispute over Form Numbers seems to me to be the following. If only mathematical numbers exist then it is easier for Aristotle to explain numbers as abstractions from countable groups of things. But if Form Numbers exist separate from and prior to mathematical numbers as their formal causes, then they cannot be explained away as abstractions.[21] Thus Aristotle has a clear motivation for objecting to Form Numbers, but it remains unclear whether he reports Plato's view accurately or whether his objections even work. In addressing these questions, we must look at the logical schema involved in his outline of possibilities onto which actual (historical) views are mapped.

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[20] In response to Aristotle, Syrianus (*In Met*. 113.26–28) also emphasised the simplicity of Form Numbers, though he seems to have a Neoplatonic axe to grind.

[21] This underlying philosophical issue is nicely brought out by Syrianus and, subsequently, by Proclus (*In Eucl*. 12.7 ff.) when they simply assert the independent existence of Form Numbers and refuse to accept Aristotle's account of them in terms of abstraction.

At *Metaphysics* XIII, 6 Aristotle returns to the third question of XIII, 1, namely, whether numbers and Forms are the substances and principles of things. But here the topic is introduced as an inquiry into the implications of the claim that numbers are separated substances and the first causes of things.[22] If a number is some distinct nature and if its essence is simply to be a number, then there are three possible views:

(1) It is possible for any unit to be non-comparable with any other unit whatever.
(2) It is also possible for units in Form Numbers to be non-comparable with units in other Form Numbers, e.g. units in Two Itself may be non-comparable with units in Three Itself.
(3) If all the units are comparable and undifferentiated, (a) then only mathematical number is possible, and (b) Forms cannot be identical with numbers.

The second (2) possibility involves the rather bizarre view that the units [14]
within each Form Number are comparable, and hence combinable with each other, yet that the units which constitute different Form Numbers are not comparable with each other. Thus, for instance, the units in what Aristotle calls 'the first two' are combinable with each other but not with the units which constitute 'the first three'. It seems that he is referring here to Form Numbers and insisting that, since they are related to each other as prior to posterior, their units are also specifically different in such a manner as not to be comparable with each other. This is why he distinguishes between the normal mathematical way of counting units which are completely comparable, and some eidetic manner of counting that goes as follows: after one another two is counted which does not include the first one and, similarly, a different three is then counted which excludes the previous number two.

In relation to possibility (3) that all units are comparable and undifferentiated, Aristotle argues at XIII, 7, 1081a8–12 that no Form can be identical with that sort of (mathematical) number (i) because there is only one Form of each thing; (ii) but these undifferentiated numbers are limitless. (iii) So this particular three or any other number cannot be Man Itself. This argument

[22] Orna Harari-Eshel has suggested to me that Aristotle may be making his usual criticism of Plato's Forms, namely, that Plato is treating universals as particular substances. In support of her suggestion, one might appeal to *Met*. 1084b20–25 where Aristotle analyses the Platonic mistake as stemming from the confusion of a double standpoint, i.e. of mathematics and of *universal logoi*.

depends on contrasting the uniqueness of Forms with the multiplicity of mathematical numbers composed of completely comparable units. If all units are combinable, then since any two units make two, there will be many twos and hence two will no longer be unique. But the Form number Two is unique, so that on this option numbers cannot be Forms. But Aristotle goes further in assuming that not only are all numbers Forms, but that all Forms are identical with numbers. According to Annas (1976: 167), this is clearly a polemical move rather than a report on an actual Platonic doctrine, since Aristotle has to make up his own examples and he produces an argument that Forms *must* be numbers; which is ineptness on his part, if Plato actually said that they were.

With reference to possibility (1) that all units are completely non-comparable, Aristotle argues at *Met*. 1081a17–25 that completely non-comparable units cannot constitute either mathematical or Form Numbers. The first part of the argument depends straightforwardly on the assumption that mathematical propositions apply only to numbers whose units are undifferentiated and hence completely comparable with each other. The second part involves an indirect argument to show that Plato's account of the generation of Form Numbers makes assumptions that conflict with the hypothesis of non-comparable units. For instance, if the units in the first Two come into being simultaneously, then they cannot be ordered as prior and posterior, as the hypothesis of complete non-comparability implies. Furthermore, if the generation of Form Numbers involves the 'equalisation of unequals', this is taken by Aristotle to imply that their units must belong to
[15] the same genus | by virtue of equalisation, which conflicts with the hypothesis of non-comparability. But at *Met*. 1081a35–b9 Aristotle says that nobody has claimed that units are (non-)combinable in this way; although it is reasonable according to their principles, yet in reality it is impossible. It would be strange for him to give so much attention to this possibility, if he were not using it as a stalking-horse against the Platonic theory of Form Numbers. The two Platonic principles being exploited for the sake of argument are: (1) priority and posteriority among numbers; and (2) denial of a common genus for entities such as the series of numbers which are related as prior and posterior (cf. *EN* 1096a17 ff., *EE* 1218a1 ff.).

But he reserves most of his attention for the second (2) possibility that some units are comparable, while others are not, presumably because he thinks that this is the view espoused by advocates of Form Numbers. For instance, at *Met*. 1082a15–26, he argues that it is impossible that *two* be some nature separate from two units, or that *three* be something separate from three units. Here he is raising the difficulty of how Platonic Form Numbers

can exist separately (actually) apart from the units which constitute them. Even if Form Numbers were conceived by Plato to solve the difficulty about the unity of numbers, Aristotle refuses to accept this as a solution to the unity of monadic numbers. How can a number like 2 be a unity? It fails all the Aristotelian conditions for being a genuine unity. Aristotle thinks that the Platonists simply present such a number as a collection of units, but a collection is not an entity over and above its members.

Indeed, at *Met*. 1082b1–10, Aristotle goes on to argue that it is absurd and fictitious to differentiate the units in any way. This argument marks a new stage in his argumentative strategy because, instead of focusing on the internal contradictions of the Platonic view, he describes it pejoratively as a fictitious hypothesis by contrast with the ordinary assumptions made by the practising mathematician.[23] That hypothesis is confronted with the ordinary way of counting, which is usually by means of the repeated addition of units, and addition implies that one Form is part of another Form. But this conflicts with the hypothesis about the generation of numbers from the One and Indefinite Dyad. Furthermore, Platonists hold that (1) Forms are identical with Numbers; so (2) one Form cannot be part of another Form; however (3) a number can always be part of another number. Such arguments are typical of Aristotle's criticism of Academic thinkers who reduce everything to mathematics, i.e. that their peculiar assumptions conflict with the ordinary practice of mathematicians.

This argumentative strategy is evident at *Met*. 1082b11–19, where Aristotle [16]
claims that ordinary assumptions about units create difficulties for the theory of Form Numbers. He has in mind such assumptions as that adding one unit to another always yields 2, which is not the case if the units are not comparable. This is confirmed at *Met*. 1082b19–28 when he claims that, if every two units make two, then the Forms cannot be numbers. In general, Aristotle thinks (*Met*. 1082b28–37) that it is absurd to infer such a major difference in substance from different modes of counting. Although it is possible to count by adding one to the previous number as mathematicians do, or by doubling as the Platonic use of the Indefinite Dyad seems to suggest, yet that does not imply that either the units or the numbers involved are radically different. In fact, he concludes (*Met*. 1083a1 ff.), it is impossible for units to be differentiated in any way.

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[23] This attitude also seems to be reflected in *On Philosophy*, Fr. 11 Ross, where Aristotle demands to know how anyone could understand ideal numbers which are not mathematical; cf. Syrianus, *In Met*. 159.33–160.5.

III. *Aristotle's Conception of Numbers and Their Unity*

Even though Aristotle rejects the separate ontological status which Plato gave to Form Numbers, he still faces the same problem of explaining the cause of unity within numbers, especially since he adopts the standard Greek notion of number as a plurality of units. In this section, I first survey the various definitions of number which Aristotle offers, so as to establish the contours of the problem that he faces concerning the unity of number. Next I will consider some passages where he refers to this problem within the context of his criticism of Platonic approaches to the definition of substances. Then I will explore some possible solutions which may be attributed to Aristotle in the absence on his part of a clear and explicit answer to the problem. Finally, I will try to assess the adequacy of these solutions with reference to the ancient mathematical context, by contrast with the modern context where concepts of number have been influenced by Frege's foundational work.

Categories 6, 4b25–31 says that number is not continuous because the parts of number do not touch at a common boundary, e.g. two 5s in 10. But the obvious question is what makes a number a unity, given that unity cannot be derived from continuity as conceived in the *Categories*. At 5a30–32 Aristotle says that a number lacks position, though it has order (τάξις) because one is counted before two and two before three. Here the concept of number seems to be closely related to the notion of counting in order. On the other hand, *Met*. V, 13, 1020a7–11 defines number as a finite multitude (πλῆθος πεπερασμένον), while a multitude means a quantity that is potentially
[17] divisible into parts that are countable and not continuous. Just | as in a continuum, each part which belongs in it is a one and a this (ἕν τι καὶ τόδε τι), but it is countable (ἀριθμητόν) rather than being measurable (μετρητόν), as in the case of continuous quantity. This appears consistent with the definition of number as a composition of units (σύνθεσις μονάδων, 1039a12), yet there may be a difficulty about the unity of the synthesis involved, since he frequently says that number is a multitude of units (πλῆθος μονάδων, *Met*. 1053a30, 1085b22, 1088a4–8). He also describes number as a multitude measurable (μετρητόν) by one (*Met*. 1056b23–24, 1057a2–3, 1088a4–8) and this appears to be inconsistent with the previous distinction between countable and measurable. Yet it might be the case that this distinction in V, 13 does not fit the ordinary usage because Aristotle wanted to specify that discrete units are counted, while magnitudes are measured by units, though not discretely. But in *Metaphysics* I, 1 Aristotle seems to conflate these two concepts. Elsewhere, he says that number is many ones and hence many things (*Phys*. 207b7, *Met*. 1082a22).

There are a number of passages where a specific aporia about the unity of number is to be found in Aristotle. Perhaps the most explicit reference to that aporia comes at *Met*. VIII, 6, 1045a7–12 where he refers back to an earlier discussion of the question concerning definitions and numbers, namely, what causes each of them to be one. Obviously, the question can be applied to any composite totality which is not merely a heap but is rather some unified whole over and above the collection of its parts. We can immediately see the similarity to the question raised by Plato in the *Theaetetus* with his dilemmas about the relationship between a whole and its parts. In the *Metaphysics* passage, however, the general context is provided by a discussion of the unity of definition and of the substance defined. For Aristotle, definition does not become unified by the linking of words together, as in the case of the *Iliad*, but rather by virtue of being a formula of something that is essentially unified.

Therefore the question about the unity of definition can be reduced to that about the unity of the object defined. That is why Aristotle goes on to ask about what it is that causes a substance like man to be one, rather than being many things such as animal and biped, as the standard definition might suggest, if one were to accept that each of them is a Platonic Form, i.e. Animal Itself and Biped Itself. Aristotle clearly regards this way of thinking as being partially responsible for the aporia, since he insists that one cannot solve the difficulty if one makes such Platonic assumptions about separate Forms. Instead, he offers his own solution by suggesting that we treat one part of the defined object as matter and the other as form, so that one part is potential and the other is actual. Using the artificial example of 'cloak' which is defined as 'round bronze', he points out that what is being sought is the cause of the unity of roundness and bronze. In Aristotle's | terms, the question is about [18] what causes that which exists potentially to exist actually, or in other words, how to explain the unity of matter and form in the composite. Of course, in the case of artifacts like the round bronze, there is an external cause of generation in addition to the essence, which is the real cause of unity in natural substances.

All of this is familiar Aristotelian doctrine about the unity of substance, but it remains unclear how it should be applied to number, given that Aristotle denies that numbers are substances. In the above passage there are some tantalising hints to be found in his distinction between sensible and intelligible matter, since the latter is usually linked with mathematical objects. This is partially confirmed by his example of 'plane figure' as a definition of a circle, which he uses to illustrate how one part of a definition designates matter (or potentiality), while the other part designates form (or actuality). Although Aristotle seems to have forgotten about the unity of

number, one might assume that he intends to resolve the problem in the same way, namely, by treating number as a composite of form and matter which is reflected in the standard definitions. On this interpretation, therefore, the matter of any number would be its constituent units, which are analogous to an indefinite material element that is made definite by some form that brings to actuality the definite multitude that constitutes any given number. All this sounds plausible enough as a typical Aristotelian view until we inquire about the nature and status of this form that plays such an important causal role in the unity of each number.

In trying to determine Aristotle's own solution to the problem about the unity of number, I will briefly explore the following possibilities: (a) that some internal form unifies the matter of number, which consists of indivisible units; (b) that some external form is imposed on these units by the soul of the counter; (c) that number does not have any unifying form but is merely a heap or multitude of units. Of course, this does not cover all the logical possibilities, but perhaps it is sufficient to examine the working assumption that Aristotle treats number as a compound of form and matter. Let me now examine whether any one of these possibilities is to be preferred on the basis of textual evidence.

It is very hard to find Aristotle giving a clear account of a number form anywhere, though we can see that he was aware of the relevant problem in *Met*. VIII, 3, 1044a3–5, when he insists that there must be something in a number by which the number is one, even though the Platonists fail to say anything about what it is that makes a number one. In defence of his claim, he offers the classic dilemma about number: either it is a mere heap of units or it is a unified object, and if the latter is the case then one ought to give some account of what is responsible for the unity that brings a multiplicity
[19] of units into a unified compound. The failure of Aristotle to | provide his own positive account is baffling, given the clear demand which he makes of the Platonists, unless perhaps he thinks that it applies only to the claim that numbers are independent substances like Forms. For instance, within the context of his critique of Platonic Form Numbers in *Metaphysics* XIII, he lists the following as possible causes for the unity of number: contact, mixture, position (*Met*. 1082a20–21, 1085b11–12).

The general context for the above-discussed passage in *Metaphysics* VI is provided by the puzzle about the special way in which numbers are held to be substances rather than being composed of units, as some people think (*Met*. 1043b32 ff.). This special way depends on the analogy between number and definition, which is also divisible into indivisibles because no formula is infinite. Similarly, if one adds or subtracts any of these basic units from

the definition, it becomes a definition of something else, just as a number is made different by adding or subtracting units. But, despite what some people think, there are important differences between the parts of the substance being defined and the units of a number, which are homogeneous and like matter. By contrast, even if they are indivisible, matter and form as parts of substance are neither homogeneous nor are both matter. Thus, if we are to discover what Aristotle holds about the unity of number, it seems that we should consider the analogy with the unity of substance, while also paying great attention to the disanalogies.

A promising passage is to be found in *Met*. VII, 13, 1039a11–14, within the general context of Aristotle's rejection of Platonic Forms as substances that might satisfy the criteria established at the beginning of his inquiry. With regard to the criterion of unity, he claims that no substance is composed of substances existing in actuality, since any two objects which exist in actuality can never be one in actuality. However, if two objects exist only potentially they can be unified, e.g. the double line is composed of two half-lines, yet these exist only potentially since their actualisation would involve their separation from each other. Although the example is intended to illustrate how a single substance cannot consist of other actual substances present in it, Aristotle says that the situation is similar for number. Given the standard definition of number as a composite of units, there are two options: either the number two is not one thing or no unit in the number two exists in actuality. Once again, on account of the aporetic context, Aristotle does not explicitly state his own view about the unity of number, but we might conjecture that he regards the units as potential parts of any number, and that some corresponding form is responsible for unifying them as the composite whole that is each number. But we are given no account of the nature and status of that form, which would be the cause of unity in number.

At *Met*. XIII, 2, 1077a20–24, the question is really about the cause of unity [20]
in mathematical magnitudes, but it can easily be extended to units, which are the parts into which discrete magnitude (as distinct from continuous magnitude) are divided. According to Annas (1976: 145), Aristotle demands to know what makes mathematical objects one. He compares them adversely to items which he takes to be obvious unities. An organic unity like a human being is one in virtue of soul or some characteristic organisation of behaviour. A plant or very primitive animal is one in virtue of part of soul, e.g. the nutritive capacity or ability to grow and maintain itself even without the higher capacities possessed by most animals. There are also non-organic unities held together with string, glue, etc. (*Met*. IV, 6, 1015b34–1016a4).

Clearly influenced by Frege, Annas claims that the strangeness of this argument is partly due to the fact that Aristotle has not distinguished two questions contained in 'Is this thing one?', as that could mean 'Is this thing unitary?' or 'Is it a unit (one in number)?' She thinks that his point is that when dealing with physical objects we clearly know when we have one and when we have two, but that is not the case with abstract objects of mathematics, even though mathematicians talk of 'dividing' them. Annas takes this to be a complaint about the conditions for individuating them being obscure, which is a standing complaint of modern anti-Platonism, e.g. Quine's maxim 'No entity without identity'. If we cannot individuate objects clearly, we have no reason to say that there are such things, and this clearly will favour concrete over abstract objects. But, as she recognises, the form of Aristotle's demand for the principle that holds mathematical objects together suggests rather that he is talking about what makes such objects unities, while complaining that there is nothing analogous to soul for living things. Although somewhat naive, Aristotle's objection is taken by Annas to reflect a 'ground-floor' refusal to take on trust (without proof) anything that the Platonist assumes about mathematical objects. But still we would expect him to supply an alternative answer to the question about the cause of unity in numbers.

Perhaps the key to Aristotle's own solution to the problem of the unity of numbers is to be found in his analysis of the error of the Platonist approach (*Met*. 1084b23–32), which he takes to involve a confusion of the mathematical and dialectical modes of inquiry. The mathematical approach typically analyses number into its material constituent parts (units), so that the one (unit) is regarded as prior to the composite in genesis (time). By contrast, the dialectical approach gives priority to the form of the composite over against its material parts; so that the Dyad, for instance, is prior to the units which compose it. According to Aristotle, Plato's simultaneous use of these two approaches leads him to posit Form Numbers, which are actual
[21] substances | composed of non-comparable units. This hypothesis yields the sort of difficulties explored in detail in XIII, 6–9, including many conflicts with basic arithmetical axioms.

Aristotle's own solution would seem to involve a distinction between the mathematical approach to numbers, which analyses them into their elementary units, and the dialectical approach which views the number forms as universals. While he rejects the Platonic view that numbers are independent substances, the alternative ontological status which he assigns to them remains unclear. He does not seem to posit an internal form that unifies each number but perhaps he thinks that there is some external form

(or universal), provided by the counting soul, which unifies a multiplicity of units into the composite whole that is each number.

In *Physics* IV, 11 Aristotle's distinction between the numbers by which we count and the numbers counted seems to be analogous to the Platonic distinction between Form Numbers and mathematical or sensible numbers. Elsewhere, he also speaks of arithmetical number as monadic by way of contrast with other sorts of number (*Met*. 1080b19–30, 1083b16, 1092b20–24). For Aristotle's purposes a unit is anything that can function as a unit, though he does distinguish between concrete units and mathematical units, which are described as beings without position (*An. Post*. 72a23–24, 87a35, 88a33–34; *Met*. 1016b23–28, 1084b26–27). Henry Mendell (1985: 224) thinks that the distinction between abstract and concrete number is Aristotle's solution to the Platonist problem because the relation between monadic number and other countables is the same as that between intelligible and physical triangles. Thus at *Physics* 219b5–11 Aristotle claims that number is said in two ways: that which is counted and that by which we count. Ross (1936, ad loc.) thinks that the distinction is between abstract and concrete number, while Hussey (1983: 161–162) claims that abstract number is like a species covering all kinds of concrete numbers.

But the units from which the monadic number is composed are themselves anything having unity that is taken as unity. However, in addition to the unit of counting, we need ordered numbers to serve as that by which we count, since we must use the succession of numbers as a guideline whether we are counting abstract or concrete units. Thus Aristotle cannot treat the numbers by which we count simply as a collection of units. On the other hand, if he takes monadic number to be the form of number, he may be open to the same objections which he made against incomparable numbers. According to Aristotle, one can say that the number of horses and dogs is the same, though the multitudes of horses and dogs are different. Similarly, one can say that the units in one half of the monadic six are different from those in the other half, though the number of them is the same. Thus Aristotle cannot hold that the number of horses (or dogs) is the monadic number. | [22] But the number by which we count might be simply the sequence in which each member is determined by what comes before. So Aristotle might regard number as having two aspects, namely, the formal aspect which enables us to go through a sequence of counting, and the material aspect which can be either the abstract or concrete units that get counted.

Let us now examine the problematic passage in *Physics* IV, 14, 223a16–29 which seems to make the existence of number dependent on a soul that counts. Argument:

(a) if there were no soul would there be time? (leading question);
(b) if it is impossible that there should be something to do the counting, it is also impossible that anything be countable;
(c) so it is clear that there would be no number either;
(d) for number is either that which has been counted or that which can be;
(e) But if there is nothing that has in its nature to count except soul, through the part that is intellect,
(f) then time is impossible if soul does not exist.

Annas (1975b: 101) thinks the passage implies that number has no existence independently of the activities of counting, but Mignucci (1987) refuses to accept such a 'constructivist' interpretation. According to his analysis, everything depends on the scope of the modal operator, since it is the impossibility of the existence of someone doing the counting that entails the impossibility of there being countable things. Suppose that, in fact, nobody does the counting (without the fact being impossible) then it does not follow that countable things cannot exist, e.g. there could be ten horses even if no one actually counted them.[24] Mignucci holds that clause (b), if properly understood, does not commit Aristotle to the view that the existence of numbers is made dependent on the activity of counting in a subjectivist or constructivist fashion. On the other hand, Aristotle is not committed to conceptual realism of a strong Platonic type, which postulates a world of ideal objects for mathematical relations. He holds that they are affections of perceptible individual things that can be separated logically and conceptually for the purposes of inquiry. While this view is difficult enough to accept for
[23] geometry, it seems impossible for arithmetic because properties like odd | and even do not belong to individual and perceptible objects, as Frege objected in his *Foundations of Arithmetic*. According to Aristotle, arithmetic studies perceptible things qua indivisible, so it is really about indivisibles, i.e. number defined as a plurality of indivisibles (πλῆθος ἀδιαιρέτων, *Met*. 1085b22) or as a plurality of units (πλῆθος μονάδων, *Met*. 1053a30. See also *Met*. 1020a13, 1057a3–4, 1088a5–6.)

[24] For Aristotle this may not be true in the case of motion which is continuous and hence not divisible into discrete and countable parts, so that an external source is needed to provide the measure of motion which constitutes time. Therefore, this whole discussion of time may not provide a reliable basis for a general claim that Aristotle holds that number depends on a soul to do the counting, as he may have thought that soul is not necessary where there are natural units for counting like species and individuals.

But Aristotle does insist that the unit by which we count a collection must be homogeneous with members of it (*Met*. 1053a24–30, 1088a8–11, *Phys*. 223b12–15). Why is this required if counting simply means pairing off members of a collection with an initial segment of natural numbers? This technique should allow us to count arbitrary sets of items. Mignucci proposes the relation: "… differs from …", as basic to counting because to collect individuals under an appropriate sortal concept involves recognising that they differ from each other. By recognising the diversity of the units, we can determine what is the number of that collection, and so answer the question: how many? In this way, counting can be carried on without presupposing numbers because the relation 'being different from' can be expressed by logic only.

How well does this fit Aristotle's account? Clearly, he accepts the traditional definition of number as πλῆθος μονάδων/ἀδιαιρέτων, which depends on the meaning of 'unit' and 'indivisible'. For him the units that form a number are individuals under a sortal concept, which provides a criterion for identifying the individuals to be counted. Aristotle insists that not every plurality of discrete objects is a number because number is defined as a plurality measured by a unit (*Met*. 1057a2–4). Hence not every collection of objects is a number (contrary to the modern notion of arbitrary sets) but only a collection whose members fall under a common sortal concept (*Met*. 1088a4–11). Mignucci thinks this implies that numbers are second-level predicates in Frege's terms, because numbers express how many instances of a given sortal concept there are. But that is pushing Aristotle too far in the direction of modern second-level thinking about number. Similarly, Mignucci interprets *Phys*. 207b1–10 ('three' and 'two' are derivative names) as confirming that substantives like 'two' and 'three' are derived logically and ontologically from adjectives, so that Aristotle begins to sound far too much like Frege.

In fact, however, we can see that both unit and number remained first order predicates for Aristotle, when we examine *Metaphysics* X, 1–2 which contains a rare extended discussion of these two concepts. In that treatise he refers explicitly to the aporia about the essence and nature of oneness, i.e. whether it is an independent substance or an attribute of some other subject. In brief, Aristotle concludes (1054a9 ff.) that one is not itself a substance but is rather a universal predicate of something else, such as man; so that to | call [24] something 'one man' is nothing more than to call it 'man'. Thus, if we count something under its species description, we shall know its number because the species form serves as the indivisible unit of counting (*Met*. 1053a20–21 & 1016b1–5).

In general, Aristotle insists that the measure must always be of the same kind as that which is measured (1053a24). However, the measure of a number is most accurate because the unit is posited as indivisible in all respects. Even though this is the primary meaning of oneness, which is the principle of number *qua* number, this does not imply that arithmetical units are the only things that can be counted (see also *Met*. 1016b18–23). In fact, almost anything can be counted so long as we can discover a measure which is one and indivisible in some respect that imitates the paradigmatic case of unity. In every case, this serves as a measure by which the quantity is known (*Met*. 1052a20 ff. & 1016b18–19). Thus, for instance, we know the length of something in terms of some measure of length, or width by some measure of width, just as number is measured by a unit. However, unlike the other cases, the measure of numbers is not itself a number, according to Aristotle, though one might think so from the parallel with length and width. The reason is that number is defined as a plurality of units (*Met*. 1053a30), and so a single unit does not qualify as a number.

In stark opposition to the Platonists, however, Aristotle seems to hold that number is not something unified like a substance but rather more like a heap (σόρος), since number consists of units that differ from each other, and each number is counted simply by adding units. He appears to be wary of attributing too much unity to any number, since he identified this as the key mistake of the Platonists (*Met*. 1082b19–37, 1044a15–25). Three, for instance, is not a single separate being but is just three units counted together; so that no new form or composite whole comes to be when the counting is done. There is no cause of its being in the sense of an internal form, but only the unit measure and the numbering soul which counts these as just so many. Thus any number can be described as a measured multitude (*Met*. 1088a5) because its amount has been determined in relation to the measure. However, although the unit may be the principle of number, yet there is still a need for someone to count such units.

Aristotle seems to suggest (*Met*. 1078a23–28) that the indivisibility of arithmetical units is ultimately dependent on that of natural substances, such as man, but yet it is necessary for someone to take man as an indivisible measure for the purposes of counting. However, he appears to ignore the need for the counting soul to be already familiar with the series of natural integers, if it is to successfully complete the count of units that makes up any given number. Once again, this shows that Aristotle is giving priority to the traditional Greek conception of number as a cardinal, by contrast with | the notion of an ordinal, i.e. as a series beginning with one. It [25] seems that he never saw the implications for numbers as ordinals that

follow from the use of the Greek alphabet to symbolise both the natural integers and unit fractions.[25]

Conclusion: Misleading Comparisons

Is it safe to make comparisons with modern views, given the conflicting scholarly opinions about Plato's and Aristotle's views on number? We can find scholars on both sides arguing that Plato had an advanced concept of number which Aristotle failed to understand, or even that Aristotle's concept of number anticipated Frege's. How could two contemporaries so misunderstand each other, yet uncannily anticipate modern conceptions of number? I suggest that the misunderstanding lies with modern interpreters who naturally tend to interpret ancient views of number from the modern perspective. In Frege's classic work on the foundations of arithmetic,[26] we find him explicitly denying most of the ancient assumptions about number that we have touched on here. For instance, he argues that number is not the product of a combination of things, nor can it be defined in terms of a multitude or plurality of things. Furthermore, Aristotle's definition of units as indivisible in every way does not resolve the problem of how units can be both identical and distinguishable, as they must be if they are to function as units for counting. In order to resolve such problems, Frege introduces the distinction between a concept and an object, which seems to be an innovation in the history of philosophy and of mathematics.

For what it is worth, my own conjecture is that Plato's originality lay in grasping the primacy of ordinal number over cardinal number; this was facilitated by the historical development of a new system of alphabetic numerals around the end of the fifth century, which was officially adopted at Athens, though it only gradually superseded the older acrophonic system. Whereas the older system was used almost exclusively to represent cardinal

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[25] Fowler (1999: 227) notes that even the basic sequence of ordinal numbers, as represented by the letters of the Greek alphabet, was almost synonymous with the corresponding sequence of unit fractions. Thus the sequence 'half, third, quarter, fifth …' is often confused with the nearly homonymous sequence of ordinal numbers: 'second, third, fourth, fifth'. Euclid *Elements* VII: 37–39 refers to an *arithmos* and its corresponding *meros* as being 'called by the same name' (ὁμώνυμον). This linguistic fact may have helped to confirm Aristotle's assumption that even ordinal numbers are composed of parts, given that they serve as denominators for unit fractions.

[26] See Frege 1884, section 45, for a summary of conclusions about traditional conceptions of number and outstanding questions that he proposes to answer through his conceptual innovations.

numbers, the alphabetic system could represent both ordinal and cardinal numbers, and so was much more flexible for calendars and other tasks that | [26] depended on a specific ordering. Plato seems to have been the first to see that ordinal number is logically prior to cardinal number, despite being temporally posterior; whereas Aristotle never got away from the older conception of number as a collection of units, especially since this concept continued to be reflected in the standard definitions of number as a limited multiplicity of units.[27]

[27] Within the later Greek tradition of arithmetic, the use of letters from the Greek alphabet as symbols for number was still regarded as an artificial human convention by contrast with the more natural way of representing numbers as collections of units; cf. Nicomachus of Gerasa, *Introduction to Arithmetic* 11.6.2 ed. R. Hoche: 83–84. So long as numbers are conceived of as patterns of dots or units, in the Pythagorean manner, then cardinal numbers will appear to be natural, whereas ordinal numbers will seem to be conventional, just like the use of alphabetical letters as symbols for them.

Introduction

In this paper I will discuss some puzzles regarding the first principles proposed by Plato, and criticised by Aristotle in the course of his typical dialectical process of developing his own first principles in metaphysics. Apparently, Plato's first principles were the highest universals, such as One and Good, which he regarded as the most intelligible and the most real. In contrast to Platonic Forms, however, Aristotle posited substantial particulars (including unmoved movers) as the most real, though not always the most intelligible things; so it was also necessary for him to posit universals as principles of knowledge. It may have been the mathematical sciences that tempted Plato to choose the highest invariants, like the One and the Good, as first principles; whereas biological and physical inquiry probably led Aristotle to pay more attention to individuals which embody specific characteristics that differentiate them from other species. Thus particulars that are numerically one are more substantial for Aristotle, while universals that are generically one are less substantial though more intelligible. Yet his generic principles such as form and matter are almost as general as Plato's One and Good, although Aristotle insists on their specific differentiation, both epistemologically and ontologically. As generic principles, however, they are no more than analogically the same, while they become fully explanatory only when they are specifically differentiated as principles of special sciences, which study distinct genera of things. Thus it seems that Aristotle was implicitly criticising Plato's completely generic principles when he insists that it is a mistake to cross into another genus of things.

[71] Since Plato's dialogues are not Academic treatises that set out principles of inquiry in any systematic way, there is a special difficulty about discovering his fundamental principles, despite some hints in the dialogues about principles higher than the Forms. In the *Timaeus* (48c2–d4, 53d), for instance, he makes obscure references to more remote cosmological principles that are perhaps accessible only to divine minds. By contrast, Aristotle's treatises explicitly seek the first principles of inquiry for metaphysics and other sciences, such as physics, which Plato does not seem to have accepted as a science. Yet both of these thinkers did acknowledge mathematics as a theoretical science, which provided each of them with inspiration in

different ways. Thus mathematics is a crucial nexus for any discussion of the similarities and differences between Plato and Aristotle in their inquiries about first principles. In the *Philebus*, for instance, where Plato posits Limit and Unlimited as elements, one can detect the influence of Pythagoreans like Philolaus, who introduced these as two cosmological principles. By contrast, Aristotle rejects such mathematical principles as irrelevant for natural philosophy, though he accepts the need for physical principles that will play a role similar to that of principles in mathematics. In effect, he adopts a mathematical model of science, while rejecting the related Platonic ontology because he regards physical objects as being more substantial than mathematical entities.[1]

Undoubtedly, both Plato and Aristotle are dealing with an inherited problem of finding starting-points that are secure enough as foundations (both ontological and epistemological) on which to build a dwelling place for the philosophical life. To compound their problem-situation, as inherited from Parmenides and Heraclitus, they faced stiff competition from the so-called Sophists, whose approach was based on commonsense assumptions about knowledge and reality. Taking Socrates as his moral guide, Plato tried to solve the problem of foundations by positing Forms as eternal realities which transcend the flux of sensibles and to which one can look for fixed standards of conduct. But even the theory of Forms faces its own foundational problems, which are explored in the *Parmenides* through a dialectical inquiry into the hypothesis of the One. There are also vague hints in | the *Republic* [72] that the Good is the ultimate hypothesis which may serve as a principle of unity and intelligibility for the Forms, although there is no reference in that dialogue to any corresponding principle of multiplicity.

I. *Platonic Principles*

We face a difficult hermeneutical problem in trying to reconcile Aristotle's reports about the One and the Indefinite Dyad with the notable absence from Platonic dialogues of any detailed discussion of the highest principles of being, even though the *Philebus* does discuss Limit and Unlimited as elements of reality. In addition, the *Republic* hints at the existence of a highest principle of reality, which is called the Good. The later Neoplatonic tradition (after Plotinus) tended to identify this principle with the One, which itself was explored as a hypothesis for dialectical inquiry in the *Parmenides*. The

[1] See Cleary 1995 for a detailed discussion of these ontological and cosmological issues.

interpretive puzzle which still confronts modern commentators is whether all of these Platonic hints add up to a consistent account of first principles that corresponds with Aristotle's reports. I will try to avoid the shoals of controversy by confining myself to the task of comparing what Plato says about Limit and Unlimited in the *Philebus* with what Aristotle reports elsewhere about the One and the Indefinite Dyad. In the course of this inquiry, I will briefly examine the possibility of linking the principle of Limit with the One and the Good in Platonic terms.

Aristoxenus, a member of the Lyceum, recounts Aristotle's story about Plato's infamous 'Lecture on the Good', which was attended by some ordinary Athenian citizens who expected to derive some practical benefit from it.[2] Much to their chagrin, however, Plato gave a rather esoteric lecture about mathematics, numbers, geometry, and astronomy, which culminated in the claim that the Good is Unity. To the plain citizens of Athens this claim may have seemed paradoxical because they assumed that there are many human goods, such as health, wealth, power, and happiness.

[73] Apparently, Aristotle used to tell this story to his own pupils, partly to warn them against misleading advertising for public lectures and partly to take issue with Plato's view, since Aristotle himself shared some of the commonsense assumptions of that original audience. For him it was obvious that the good is spoken of in many ways, and so it is paradoxical to claim that it is identical with unity because that implies that it has only one real meaning. Of course, Aristotle's own considered view is that the good is a *pros hen* equivocal, just like the one, so that he seems to be offering an alternative to the Platonic view when he attributes a primary or focal meaning to both the one and the good. But he does not accept that the meaning is the same in both cases, especially since that meaning was held by the Platonists to be mathematical in character. Later in this paper, I will return to Aristotle's rejection of the mathematical one as a first principle but, first, I want to consider some evidence about Plato's first principles.

Even within the early Academy, it appears that the so-called 'generation' of Ideas (including Numbers) out of two principles or elements led to a controversy between the orthodox Platonists and Aristotle, who interpreted it as a temporal genesis (*De Caelo* 279b32–280a10). Like John Findlay (1974: 43), one might side with such Platonists against Aristotle by calling it a 'logical genesis' and by comparing it to the modern step-by-step construction of the integral number series through repeated reapplication of certain primitive

[2] See Aristoxenus, *Harm*. 2.20.16–31.3 (Macran), listed by Ross 1955 among testimonia for *On the Good*.

ideas, definitions, and axioms. In any case, the principles from which the Idea-Numbers are generated are, firstly, Unity itself, i.e. the Ideal Unity present in all numerically conceived Ideas; while the second principle was variously described by Aristotle as the Indefinite Dyad, the Great-and-Small, and the Great and the Small. Since Unity was conceived of as setting bounds to indefinite continuous quantity, it would have been classified as a good within the Pythagorean tradition (*Phil.* 25e–26b). Given that it is setting bounds to the indefinite, Unity is responsible for the generation of the integral numbers, which are associated with order and harmony in the cosmos. In short, the principle of Unity seems to have been linked with the principle of the Good, which appears briefly in the *Phaedo* and *Republic*. Although Plato nowhere makes such an explicit link, yet Aristotle claims that the Platonists did make | it (*Met.* 988a13–15).[3] In the *Philebus*, however, Unity is linked with [74]
the Pythagorean principle of Limit.

The second principle used in the Platonic genesis was the indefinite continuum of quantity on which the principle of Unity or Goodness imposed limits. Findlay (1974: 44) claims that it was identical with the Pythagorean principle of the Indefinite or Infinite, but that Plato called it the Great and Small because he wanted to cover the twin possibilities of going on indefinitely in both directions of increase and decrease (*Phys.* 220b27–28). This principle is described in different ways, relative to different dimensions of ideal being; for example as Many and Few it provides the plastic material (*ekmageion*) out of which the integral numbers are shaped by the limiting action of Unity (*Met.* 1087b16, 987b34–35); as the Long and Short with reference to lines; as Broad and Narrow with reference to planes; and as Deep and Shallow with reference to solids (*Met.* 992a10–15). One piece of direct evidence from Platonic texts is *Republic* 529d, which refers to the Swift and Slow as an underlying principle of velocity. Findlay (1974: 45) emphasises that none of these species of the Great and Small belong to the instantial world but rather to the ideal structures of arithmetic and geometry. Yet, if we are to accept Aristotle's evidence (*Phys.* 209b11–17), the Great and Small does appear at the instantial level as *Chôra*. For instance, *Timaeus* 52d–53a describes the pure flux that existed prior to the ordering of the instantial world by determinate forms. Furthermore, in that sensible world, the Great and Small manifests itself in

[3] This link is reinforced by the later Aristotelian commentators; see Simplicius (*In Phys.* 453.25–455.14) who reports that Plato expounded the doctrine of the One and Indefinite Dyad in his discourse(s) on the Good. Alexander (*In Met.* 56.33–35, 85.17, 250.17–20, 262.18–26) claims that Plato's teaching about the One and the Indefinite Dyad was recorded in Aristotle's treatise *On the Good*.

the hot and cold, the moist and dry, i.e., in continua without internal limits. Within the Pythagorean tradition, the Great and Small was regarded as an evil principle, as opposed to the good principle of Unity and Limit.

Let me briefly examine some evidence in Plato's dialogues for his espousal of the Pythagorean principles of Limit and Unlimited, which may be found also in the extant fragments (B1–2 DK) of Philolaus. In the *Philebus* (14–16)
[75] Plato draws attention to puzzles about | the One and the Many, which arise not only at the sensible level but especially at the intelligible level of the Forms. He is confident that such puzzles about limit and unlimited can be handled by his dialectical method, which involves positing a definite number of Ideas between the original one and the infinity of particular things. The maxim guiding Plato's discussion (*Phil.* 18a–b) is that anyone who begins with some unity should not turn immediately to the infinite but rather to some definite number (of Ideas); and, conversely, if he begins with the infinite, he should not turn immediately to the one but rather try to discover a definite plurality before arriving at the one.

These methodological lessons are subsequently (*Phil.* 18e) applied by Plato to the initial topic in the *Philebus*, namely, whether the life of unconfined pleasure is better than the life of pure wisdom. The discussion (20c–d) is guided by specific criteria that identify the good as perfect and sufficient, such that every intelligent being pursues it, desires it, and wants to possess it. Using these criteria, Socrates concludes that neither the life of mindless pleasure nor the life of wisdom without pleasure is sufficient or desirable as the good life for any intelligent being; so that a mixed life of wisdom and pleasure is preferable to both. But this raises the question about the cause of the mixture, and in this way Plato introduces intellect (*nous*) as a cause of combination and separation (23d). At this stage, he has all the ingredients or elements needed to provide an explanation of the good life.

Before embarking on that discussion, however, Plato uses his dialectical method of collection and division to explore limit and unlimited as basic elements that are manifested as one and many. For instance, the unlimited appears to be a single genus but it is manifested in many variations of the more and the less, such as hotter and colder. It is characteristic of such continua to be without internal limit, and so they are species of the unlimited.[4] Thus, using his method of collection, Plato describes (24e–25a) the single nature of the unlimited in terms of all the things that appear to

[4] Simplicius (*In Phys.* 453.25–454.7) reports that Porphyry interpreted the doctrine in this way in his commentary on the *Philebus*, i.e. that Plato classifies the more and the less as belonging to the class of the Unlimited.

become more or less. He seems to have doubts about whether the unlimited
[76] has a genuinely single nature | because giving it a definite form would make it limited. By contrast, he defines (25a–b) the class of limit with reference to things that do not admit of more and less but rather admit a definite number (*arithmos*) and measure (*Phil.* 25e). In general, we may conclude that for Plato limit and unlimited are internal elements of the mixture that is produced by an external cause, which is later identified as *Nous* (30e). Notably absent from the discussion is any mention of Platonic Forms but these may be implied in references to a demiurgic cause (*Phil.* 27b), often identified as a divine craftsman (*Soph.* 265c, *Pol.* 270a, 273b, *Tim.* 28a, 29a, 40c, 41c).

The clearest application of these two Platonic principles is to be found in the realm of mathematical numbers, where an indeterminate assembly of units needs to be delimited so as to exist and be known as definite and discrete numbers. The unlimited and homogeneous character of these units is what permits them to be combined into assemblages in whatever way we please (*Rep.* 525, *Theaet.* 185c–d). There may be infinitely many such mathematical numbers, which are unknowable qua infinite, so the task of theoretical (as distinct from pragmatic) arithmetic is to discover arrangements of these assemblages that will bring their indefinite multiplicity under the ordering of well defined properties. For example, the most general classification of numbers is made into odd and even, and then into square and oblong, which can be classified under sameness (in figure) and difference. In this way, *Philebus* 25a–b can talk about the ultimate elements of number in terms of sameness and otherness, equal and unequal, limit and unlimited. The being of a number becomes intelligible as a determinate number through its membership in a kind that is derivable from these principles or elements. The most comprehensive kinds of number are the odd and the even (*Pol.* 262e, *Phd.* 104a, *Laws* 895e). Oddness is uniquely characteristic of number, since it involves an indivisible unit being left over in any division, whereas evenness is common to both numbers and divisible magnitudes. Thus, within the Pythagorean tradition, oddness was associated with limit, whereas evenness was linked with the unlimited. Consequently, in Greek arithmetic, specific numbers were characterised in terms of such generic features: odd times odd, even times even, or odd times even. It is against this | mathematical [77] background that we should understand Plato's choice of Limit and Unlimited as principles, and Aristotle's criticism of them.[5]

[5] The combination of these two principles may be seen as implicit in one of the standard Greek definitions of number as 'definite plurality', where One corresponds to the definite form while plurality corresponds to the Indefinite Dyad.

II. *Puzzles about Plato's Principles*

As part of his general criticism of predecessors in *Physics* I, 9, Aristotle specifically faults Plato for his inadequate account of the principles of nature. For instance, he says that Plato failed to develop adequately the notion of substratum or matter, though he did touch upon it in his account of how things come into being from non-being. According to Aristotle, Plato's Receptacle in the *Timaeus* is also a dyad called the great and small, which is identical with non-being (*Phys*. 192a7–8). Of course, this interpretation of Plato is rather forced, and some scholars like Cherniss (1944 & 1945) have dismissed it as thoroughly wrongheaded. But, as Mueller (1987: 248) points out, it is unlikely that Aristotle is completely mistaken when he uses his own concept of matter to describe Plato's Receptacle, since it may be described as a kind of material principle.[6] Furthermore, Aristotle invokes the notion of matter when discussing Platonic principles in *Metaphysics* XIII–XIV, though one might wonder whether it makes any sense when applied to intelligible objects like mathematicals and Forms. Yet Happ (1971: 257–258) has shown that a wide range of meanings are involved in Aristotle's use of the term 'hyle'. Mueller (1987) thinks that, when Aristotle refers to one of the Platonic principles as non-being, he is using his own terminology rather than Plato's. For instance, in *Physics* I, 9, when Aristotle identifies the great and small with non-being, he seems to be thinking of the Receptacle as part of Plato's solution to the problem of how what-is comes to be from what-is-not. Thus Aristotle appears to be artificially linking the account of the Receptacle in the *Timaeus* with the analysis of motion in terms of non-being in Plato's *Sophist*.

[78] But it was precisely such forced interpretations of Plato that led to Aristotle's own conception of first principles and their explanatory function within his cosmology and metaphysics. In *Metaphysics* III, Aristotle explores a number of aporias concerning first principles, for example, whether the principles of perishable and imperishable things are the same or not (1000a5–1001a3). Aristotle claims that this aporia has been overlooked both by his contemporaries and predecessors, which implies that he will use it to launch objections against their views. If the principles are the same, he asks, how is it that some things are perishable while others are imperishable, and what is the reason for the difference? While dismissing the myths of Hesiod

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[6] Claghorn (1954: 13) identifies the Platonic *Chôra* with Aristotelian prime matter, but Happ (1971: 121–130) is rightly more circumspect about any such identification, since there are many differences between the Receptacle and prime matter, despite the fact that both are indeterminate.

as unworthy of attention, Aristotle addresses (1000a19) a similar question to those predecessors who use a demonstrative logos: How come that eternal and perishable beings are derived from the same principles? Aristotle considers it unreasonable that these people fail to mention a cause, and he concludes that the principles and causes of such things are not the same. He concedes (1000b17 ff.) that Empedocles is at least consistent in making all things perishable, except for the basic elements. But that merely raises the same aporia: why are some things perishable and others not, if they are composed of the same elements? Aristotle thinks that all these objections may indicate that the principles are not the same for all things.

In *Metaphysics* III, 4 (1001a4 ff.), Aristotle describes the following aporia as the most difficult task of all to solve: whether being and one are really the substances of beings (*ousiai tôn ontôn*). Madigan (1999: 108–109) notes that it remains unclear whether any actual thinkers held his composite view or whether it is an amalgam put together by Aristotle for his own dialectical purposes. For instance, *Metaphysics* I, 6 speaks of the one as a substance and source of numbers, but it does not mention being (*to on*) as a substance or principle. *Metaphysics* 988b12 refers to people who speak of one and being as the good, but it is unclear whether the assertions 'one is the good' and 'being is the good' are two competing accounts of the good or two versions of the same account.

In support of the view that one and being are substances, Aristotle provides (1001a19–29) the *reductio ad absurdum* argument that if one and being are not substances, no other universal exists. The reason is that if the most universal predicates of all, namely, one and being, are not substances then the fact of being predicated of other things does | not justify a claim to exist alongside [79]
particulars (*Met.* 999a19–21); so no universal has any claim to exist alongside particulars. In addition, he argues (1001a24–27) that if one is not a substance, then number is not a separated nature among beings, which is also taken to be absurd (from a Platonic viewpoint?). The argument assumes dialectically that numbers have separate existence, that one is the principle of numbers, and that a number is a collection of units.

In summary (1001a27–29): If there is a one itself and a being itself, then the *ousia*, substance or essence of one is to be (simply) one, and the *ousia* of being is to be (simply) being. The reason is that nothing different is predicated of them universally, but rather they are predicated of themselves. Since one and being are the highest universals (1001a21–22, 998b20–21), there is nothing of wider extension available to be predicated of them. On the other hand, if there is a being itself and one itself, then all things are one, and there is no plurality, which is just as absurd as the monism of Parmenides. Here (1001b1–

4) Aristotle confronts the Platonists with the following dilemma: (a) If one is not a substance, then number cannot be a substance. This is taken to be absurd (for the Platonists) because one must exist as a substance in order to serve as a principle of number. (b) If one is a substance, however, this rules out plurality, which is also absurd. So this is similar to the aporia about being, since Aristotle treats the thesis that one is a substance as equivalent to the thesis that One Itself exists.

Aristotle has already (1001a29–b1) argued that if there is Being Itself and One Itself, there cannot be anything else alongside being and one. Now (1001b4–6), in support of that conclusion, he asks a rhetorical question: From what, besides the one, will another one be derived? Madigan (1999: 113) fills out the line of argument as follows: 'If there is a one itself, then plurality must derive either from one or from something different from one; but plurality cannot derive from one; hence plurality must derive from something different than one. But plurality must either be individual ones or else pluralities composed of one; hence plurality cannot derive from something different than one'. But there exists a plurality of things, hence it is false to claim that there is One Itself. Yet Platonists might say (1001b17–25) that they derive Plurality not from one alone, but from one and a dyad that is not itself derived from one.

[80] At *Metaphysics* 1001b19–24 Aristotle may be referring to such a generation of mathematical objects from two principles when he argues as follows: If number and magnitude are generated from one and something not one, why is the product sometimes a number (*arithmos*) and sometime a magnitude (*megethos*)? Aristotle seems to suggest that the thesis that one is a principle of numbers is incompatible with the thesis that one is a co-principle of magnitude. Here the derivation of magnitudes is construed not as a simple addition or composition of ones, but as a kind of generation in which two principles, one and something else called 'inequality' (*anisotês*, b23), cooperate to produce magnitudes. Madigan (1999: 115) suggests that 'inequality' may be the Platonic dyad of great and small,[7] which is also called 'unequal'[8] and as the dyad of the unequal of the great and small (*Met*. 1087b7–12). It is possible that some Platonists either recognised two distinct dyads or else described the one dyad in two different ways, i.e. the many and few as the principles of number,[9] the great and small (or species of the great and small) as the principle of magnitudes.[10]

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[7] See *Met*. 987b20–21, 988a13–14, 988a26; *Phys*. 187a17, 203a15–16, 209b35–210a2.
[8] See *Met*. 1075a33, 1087b5, 1088b28–33, 1089b4–11, 1091b30–32, 1092a35–b2.
[9] See *Met*. 1087b16, 1088a18–19, 1088b5–6, 1089b11–12, 992a16–17.
[10] See *Met*. 1088a19, 1088b6–8, 1089b12–14.

III. *Aristotle's Criticism of the Platonic Principles*

In *Metaphysics* XIV Aristotle launches a sustained attack on the principles of reality that are posited by Plato and his Academic colleagues, such as Speusippus and Xenocrates. Given the character of his polemical method, it is difficult in some cases to distinguish their views from one another, but for our purposes here I will take it that the One and Indefinite Dyad (and variations thereof) are specifically Platonic principles.[11] At the beginning of *Metaphysics* XIII, Aristotle introduces the question of whether the substance and principles of things are numbers and Ideas, but the question which he subsequently discusses is: What are the principles (elements or causes) of separate Ideas and | mathematicals? Just as in the first book of the *Physics*, [81] he complains that all of his predecessors (including the Platonists) tended to posit contraries as principles. For instance, Speusippus is reported to have posited one and plurality as the principles of mathematical number, while Plato posited one and the indefinite dyad as the principles of ideal numbers.

In effect, Aristotle's general criticism is that neither of these are suitable as principles because they are attributes of something else rather than independent substances. For instance, he argues that it is a mistake to posit such contraries as principles because some other subject is always prior to them, yet nothing else should be prior to principles. Aristotle's implicit assumption here seems to be that principles must be absolutely prior, just as substances are prior. Drawing on his own *Categories* (3b24–27), he claims that a substance has no contraries, and concludes that contraries cannot serve as principles that are independent of everything else. Having set out his stall, as it were, Aristotle goes on to show that the Platonists do posit contraries as principles, whether it be the Unequal that is opposite to the Equal (or the One), or plurality that is contrary to the One. He reports that some people (Plato?) say that the Unequal is the Dyad, consisting of the Great and Small. From this he infers (rather oddly) that there are three elements of number, the first two being Great and Small (which he describes as matter) and the third being the One (described as form). In any case, from among those who posit contraries as principles, he finds most plausible the view of Speusippus that One and Plurality are the elements of number.

In summary, Aristotle has strong objections to treating the One as an independent principle or as a substance. His view is that one signifies a

[11] Theophrastus, *Metaphysics* 6a14–6b22, refers to Plato as one of those thinkers who posit the One and Indefinite Dyad as principles.

measure of something else as an underlying subject, so that the One by itself cannot be the substance of some thing. He thinks this is obvious from the definition of one as a measure of some plurality, and that is why number also signifies a measured plurality or a plurality of measures. From his own perspective on the one, he criticises those who posit the Unequal as something one, and the Dyad as something indefinite consisting of the great and small. His general criticism is that such people are saying things that are remote from common sense and even from what is possible. The first reason he gives is that great and small are attributes or accidents of number and
[82] magnitudes, just | like the odd and the even, rather than being themselves underlying subjects. Secondly, great and small are relations, which are the least substantial of all the categories, being posterior to both quality and quantity. As evidence for the lack of substantiality of relations, Aristotle cites the fact that they are not subject to generation or destruction, nor are they in motion in any genuine sense. By contrast, the matter of each thing, and so also its substance, must be potentially that into which it will change; whereas a relation is neither potentially nor actually a substance. So Aristotle concludes that it is absurd for the Platonists to posit non-substances as prior to substances.

Specifically, Aristotle charges (1088a21 ff.) Plato with being mistaken in positing the great-and-small as a principle, since it must be a relative with less of a claim to reality than quality or quantity. Within this straightforward appeal to his own categories, perhaps there is an implicit appeal to the Academic distinction between *kath' auto* and *pros ti* entities, since that would give the objection a better dialectical basis. Be that as it may, Aristotle argues that the relative (i.e. the great-and-small) is a characteristic of quantity, and not of matter, since there is some other subject for the relative in general along with its parts and forms. The crucial ontological point is that relatives like the great-and-small, the many-and-few, have a dependent mode of being as belonging to something else, rather than an independent mode of being as self-subsisting entities. We recall that this is also how Aristotle formulated the aporia from *Metaphysics* III about whether One has an independent or dependent mode of being.

As additional evidence that a relative is least of all substantial, Aristotle cites (1088a29 ff.) the fact that relatives are not subject to change in any of the usual ways, i.e., generation and corruption, alteration, growth, or locomotion. In the case of relatives, by contrast, a thing can be greater or less or equal without itself undergoing change, if another thing that is compared to it changes in quantity. For Aristotle the association of such accidental change with relatives is a sign that they have less claim to reality than categorical

entities that suffer essential change (*Phys*. 225b11–13). I find it significant that a similar 'change test' is used in *Metaphysics* III to undermine the substantiality of mathematical entities (*Met*. 1002a28–b11).

In *Metaphysics* XIV, 2, however, Aristotle raises a general question about
[83] whether it is possible for eternal things to be composed | of elements. Perhaps, as Annas (1976: 199) suggests, he is overloading a casual Platonic suggestion with meaning, since he wants to emphasise the ontological difference between eternal and corruptible substances. Thus, by taking literally the Platonic language of 'generation' from elements, he can mount an effective dialectical offensive against what he regards as a mistaken approach to eternal entities. We know from *De Caelo* I, 10 that the question of whether such language is to be taken literally or metaphorically was one which divided Aristotle from more orthodox Platonists like Xenocrates within the Academy. Behind the dispute about language, however, lies the issue of whether Plato's mathematical cosmology gives the correct picture of the universe, but especially of the relationship between sensible and supersensible substances. Therefore, the objections made in XIV, 2 against talk of the principles as elements provide a natural introduction to Aristotle's own views in *Metaphysics* XII on the true nature of supersensible substance.

From his own (superior) perspective on supersensible substance, Aristotle critically reviews (1088b28 ff.) mistaken proposals for the first principles of such substances. For instance, he reports that some people posit the Indefinite Dyad as an element along with One because they are aware of the difficulties associated with positing the Unequal as a principle. Presumably, he means the difficulties which he had previously raised about positing a relative as a principle of substance. Yet he insists that they avoid only the difficulties arising from making such a relative entity an element, since all the other difficulties apply to their principles also, whether they use them to produce Forms or mathematical numbers.

In his general diagnosis of where the Platonists have gone wrong in the search for the principles of supersensible substance, Aristotle identifies (1088b35 ff.) their old-fashioned approach to the problem as the basic cause of their error. They accepted that all existing things would be simply one thing, Being Itself, unless they could refute the Parmenidean argument against plurality based on the impossibility of not-being. So they thought it necessary to show that what-is-not (i.e. not-being) exists in some way, in order that a multiplicity of things can emerge from being and from something else. If Aristotle is referring to Plato's *Sophist*, Annas (1976: 201) suspects him of a misunderstanding because the arguments canvassed here are not to be found in that dialogue, although it quotes the same Parmenidean | passage. [84]

But perhaps Aristotle is simply giving an historical reconstruction of Plato's motivation for positing Being and Not-Being as principles of plurality and change.

IV. *Aristotle's Principles of Sensible Substance*

In view of its self-contained character, *Metaphysics* XII may be the best place to look for Aristotle's own account of the first principles of the visible cosmos. It is partly due to his dispute with the Platonists about first principles that in XII, 2 & 3 Aristotle makes a brief survey of the principles, causes, and elements of sensible substance whose distinguishing characteristic is that it is changeable. Here he seems to be drawing on treatises like *Physics* I, since he asserts without argument that the appropriate principles are the contraries (*ta enantia*) and something that remains (*hupomenei*) throughout the change, i.e. matter (*hulé*). In specific terms, these principles are different for each kind of change with respect to whatness, quality, quantity, and place. Yet there is a general and analogical sense in which all changing things have the same principles, as Aristotle says in Lambda 4.

In his terse introduction to this inquiry about substance, which Aristotle gives in XII, 1, it is noteworthy that he calls on some Presocratic thinkers to witness to the priority of substance and its principles (*Met*. 1069a25–26). Although they might have described their subject-matter as 'what is', he insists that they were inquiring into the principles and causes of substance, presumably because it is prior to all the other categories of being. Similarly, the Platonists are reported by Aristotle to have posited the genera of things as principles, and to have made them more substantial than the substances of which they are the genera (*Met*. 1069a27–28). In this way, the Platonists too are presented as inquiring into the principles of substances. But the crucial point for Aristotle's whole inquiry in XII is that he also assumes, along with the Platonists, that the principles and causes of substances must themselves be substances because a non-substance cannot be prior to a substance (*Met*. 1073a36). Thus his inquiry into the principles and causes of substances must also involve an inquiry into the kinds of substances which can play the role
[85] of being | principles and causes of other substances.[12] This is a key point for his dispute with the Platonists.

In XII, 1, Aristotle also considers two possible ways in which the universe might exist either (a) as some kind of whole, or (b) as a series in which

[12] See M. Frede's introduction (2000) *to Metaphysics* XII and his remarks on XII, 1.

substance is prior. What is implicitly excluded here is that the universe might consist of a series of disconnected genera, each with its own set of principles. This is the cosmological view which Aristotle subsequently (in XII, 10) attributes to Speusippus, while deriding it as episodic like a bad tragedy. The dispute over the unity of the cosmos is closely related to the question about the principle of goodness, as we can see from XII, 7 (1072b30–34) where Aristotle again criticises Speusippus for holding that the good emerges only as the cosmos unfolds. In XII, 10 (1075a11) Aristotle returns to this issue by asking how the good is contained in the universe: as something separate, as the order of the parts, or as both. However, before we can understand Aristotle's own response to this question, we must consider his views on the principles of sensible substance.

Since being is spoken of in two major senses, according to Aristotle (1069b15 ff.), a single description of all changes can be given in terms of the transition from potential to actual being. Under the category of quality, for instance, one can say that a thing changes from being potentially white to being actually white. This way of speaking enables Aristotle to bypass the Parmenidean prohibition against generation from not-Being. Indeed he is so comfortable with this old philosophical ghost that he distinguishes (1069b26 ff.) three senses of 'not-being', including matter. Since all things that change have matter, non-being plays a role in Aristotle's ontology under several different guises, i.e. potential being, privation, and matter.

But it would be a mistake to treat any of these as self-subsistent unities, or even as logically determined, without reference to actual being or form, which is a primary reality for Aristotle just as much as it was for Plato, even though they disagree about how this form should be defined and understood. At the end of XII, 2 (1069b32–34), for instance, Aristotle draws upon the conclusions of *Physics* I for the causes (*aitiai*) and principles (*archai*) of changing things. Two of these are the | contraries, privation (*sterêsis*) and [86] form (*eidos*), whereas the third is matter (*hulê*). In order to see why a summary of physical principles is given by way of preamble to the metaphysical inquiry proposed for *Metaphysics* XII, it is worth recalling that Aristotle also appeals to such a schema of principles in XIV, 1–2, so as to pass judgment on the Academic proposals for principles of supersensible substance.

Having outlined the roles of matter and form at different levels of reality, Aristotle begins XII, 4 by summarising his thesis as follows. In one sense the causes and principles of distinct things are different, but in another sense they are the same, though only in a general and analogical sense. He refers back to the aporia whether the principles and elements of substances, of relations, and of each of the other categories, are the same or different. On

the one hand, if they were the same for all, this seems to be absurd because both relations and substances would have to come from the same elements. But there is nothing common (*koinon*) beyond (*para*) substances and the other categories, although the elements would have to be prior to the things of which they are elements. It would appear, both from its language and content, that this argument is aimed directly at Plato.[13]

His second argument (1070b3–4) is more ambiguous, perhaps on account of its brevity. Aristotle argues that substances are not the elements of relations, nor can relations themselves be the elements of substance. The implicit rationale seems to be that, if relations were the elements of substance (as Plato held?), then they would be prior in existence to substances, which is impossible according to his categories because relations are dependent attributes of substance. On the other hand, relations cannot be composed of substances because such a composite would be itself a substance, which is again contrary to his categories.

In his third argument (1070b4 ff.), Aristotle argues generally against the possibility that the same elements might be the elements of all things. Perhaps he has in mind especially such Platonic principles as unity and being, which he describes as intelligible presumably because they are so universal as not to be accessible to sense perception. We might reconstruct
[87] his argument as follows: suppose that either unity | or being is an element of a compound, then the compound (BA) differs from each of the elements (A and B). But the compound itself has a certain unity, and it is a certain kind of being; so it would seem to follow that the compound itself is an element, which is absurd. Aristotle's general aporetic conclusion goes as follows: No element can be either a substance or a relation. But it must be one or the other. Hence not all things have the same elements.

But then he offers (1070b10 ff.) a classic Aristotelian compromise: In one sense all things have the same elements but in another sense they do not. For instance, there are specific principles and elements of sensible things, such as the hot and the cold, and a suitable material subject; whereas there are quite different elements and principles of other things like mathematical objects. Therefore, Aristotle concludes, the elements and principles of all things cannot be the same except by analogy; just as one might say that there are three principles, such as form, privation, and matter. But even these

[13] M. Crubellier (2000) also claims Aristotle's use of the term *stoicheion* here must be taken as an implicit reference to some Platonic view of principles that is being refuted.

typically physical principles are different for distinct genera, e.g. in the case of colours they are white, black, and surface; whereas in the case of day and night they are light, darkness, and air.

Having introduced (1070b22) the distinction between elements and principles, Aristotle summarises his discussion by counting three elements, taken analogically, and four causes or principles. Of course, the three elements are different when applied to different genera, as is the 'first cause' which functions as a distinct moving cause for different things; for example the medical art is the moving cause in cases where health, disease, and the body are the elements. In addition to all these, Aristotle now mentions a cause which moves all things, as being first of all things. This seems to be a reference to the Prime Mover, which is the ultimate mover of everything in the universe. Perhaps this helps to explain Aristotle's discussion of different ways of numbering the causes and principles, though it renders more puzzling the absence of any mention of final causes from his list of principles.

Given that this chapter is concerned with the reduction of causes and principles, it is rather odd that he should not even mention the identity of formal and final causes for a fully actualised living thing. Instead he identifies the proximate efficient cause with the formal cause, which is a legitimate move at the specific but not at the individual level (*Phys*. 198a26 ff.). Finally, he distinguishes the ultimate efficient | cause from both of these, without [88] explaining how this is a principle or cause of sensible substances. Perhaps this is just an anticipatory remark which Aristotle intends to explain later in his discussion of an unmoved mover. Whether or not this is so, I think that the proper perspective from which to view the remark is established by the leading question of XII, 4 & 5, i.e. whether the principles and causes of everything are the same or different. When interpreted from that viewpoint, it may count as supporting evidence for the position that, in an important sense, they are the same for everything.

In support of this interpretation is the fact that, immediately afterwards at the beginning of XII, 5 (1070b36 ff.), Aristotle returns to this leading question by way of the distinction between things that are separate (*chôrista*) and things that are not separate, the former of which are substances. By assuming the primacy of substance, Aristotle constructs a new argument for the sameness of principles and causes for all things. Although the argument is so brief as almost to defy analysis, it deserves careful attention because of its importance for subsequent claims. While it is obviously based on the distinction between non-separated things and separated substances, it is unclear how Aristotle concludes from this that the causes of all things are the same, even though he explains that attributes and motions could not exist

without substances. The brevity of his explanation suggests that Aristotle is appealing to a familiar criterion which will clinch the argument, namely, the criterion of priority formulated in terms of non-reciprocal dependence (*Met.* 1019a1–4).[14]

As it stands, we might reconstruct the bare bones of the argument as follows:

1. Since they are substances, separated entities differ from non-separated entities;
2. But non-separated entities cannot exist without substances;
3. Therefore the causes of all things are the same.

In this skeletal form the argument is a complete *non sequitur* since the conclusion does not have any terms in common with the putative 'premises'. To
[89] flesh out the argument, one would need to | establish that the causes of separated and non-separated things are the same. Yet, even if one could assume that the substance/accident distinction is identical with the separation/non-separation one, it must still be proven that the causes of substances are the same as the causes of accidents. Thus, if the argument as it stands is to go through, one must look to the second premise for such a step. This would mean that the criterion of non-reciprocal dependence justifies not only the claim that substance is ontologically prior to attributes, but also the claim that the causes of substances are the causes of accidents. At this point perhaps we should recall from XII, 4 the aporia about whether or not the things whose causes are the same are themselves the same. If one answers in the affirmative then one is faced with the absurd result that substances and accidents are the same. While Aristotle does not repeat this aporia in XII, 5, I think it is hovering in the background. This is what must be resolved if he is to make good on his claim that the principles and causes of substance apply to all things. It is interesting to notice the examples of such causes and principles that he proposes rather tentatively in XII, 5 (1071a2–3), when he suggests things like soul and body, or intellect and desire and body. Since he treats living things as paradigmatic sensible substances, it is not surprising to find him choosing their material and formal causes as his leading examples. But in XII 5 we are given no explanation as to how these causes are to be taken as the causes of everything.

Perhaps we can look for a hint in the subsequent passage (1071a3 ff.) which says that there is another way by analogy in which the principles of everything

[14] See Cleary 1988 for a discussion of the many senses of priority in Aristotle.

are the same. We could read this as implying that the previous discussion of causes has also been about sameness by analogy, and so, by following Aristotle's own procedure closely, we may bring out the previous meaning of sameness through comparison with analogical sameness. In fact, the discussion of principles and elements and causes in XII, 4 (1070b16–19) has already established one way in which they are the same by analogy, i.e. when one speaks generally of three principles: form, privation, and matter. I think it must be by comparison with this way that Aristotle introduces actuality and potentiality as *another way* of treating principles as the same by analogy. Just as form and matter have the same relationship but different terms in distinct genera, so also potentiality and actuality lend themselves to | the [90] relationships of identity and difference that are necessary for the concept of proportional analogy.[15]

In some cases, Aristotle says (1071a6–7), the same thing is at one time actual (*energeiai*) and at another time potential (*dunamei*). The examples given of such cases are wine, flesh, and man, but I think that the last two are to be taken as distinct entities, each of which is at one time potential and at another time actual. Thus, prior to the constitution of flesh from its material elements, they are potentially flesh and then they become actually flesh when these elements have been structured according to the appropriate ratio. Aristotle further clarifies what he has in mind by correlating the potentiality-actuality distinction with the division of the causes in his previous chapter. He says that the state of actuality is appropriate both to the composite and to the form, if the latter is separated (*chôriston*). By contrast, he claims (1071a7–11) that matter is in a state of potentiality because this is the thing which is capable of becoming informed by the form or its privation. The logic of this set of correlations seems to dictate that both form and privation be counted as actualities, in contrast to matter which is always a potentiality. While it may appear rather odd to treat privation as an actuality, this is quite consistent with the division of the formal cause in XII, 4. Furthermore, the examples of privation adduced by Aristotle make this idea more plausible when we notice that both are forms, i.e. darkness and disease.

After outlining one way in which potentiality and actuality differ for the same thing, Aristotle proceeds to sketch another way in which they differ, i.e. for things whose matter is not the same. In this case the form is not the same either, so that actuality differs on two counts from potentiality. A better example is needed to illustrate this, but let us take 'man' as Aristotle does

[15] See pp. 251–297 above for clarification of Aristotle's coinage of the term 'actuality' as correlative of 'potentiality'.

in both cases. In the first case, we have the same kind of matter (e.g. flesh & bones) existing at one time in a state of potentiality (e.g. as an embryo or young child) and at another time in a state of actuality (e.g. as a fully grown human). But, in the second case, we have a different matter (e.g. elements like fire and earth) and a different proper form. Here the actuality of the form is to be found in something different outside, e.g. the father in the case of the
[91] child. | Although this suggests that the form as actuality is still the same in kind, Aristotle claims that the actuality may even be different in kind, e.g. the Sun and its oblique course. But he is careful to point out that these latter are moving causes (*kinounta*) of man and not either material or formal causes, since they are not of the same kind. Still, given that man is the proximate moving cause of man, we might call them remote moving causes since they serve as links in the chain of causality that goes back to the Prime Mover as ultimate cause.

I think it is significant for the point of his argument that Aristotle inserts here (1071a17 ff.) a caution about illegitimate types of universalising. One must see, he warns, that causes may be spoken of universally (*katholou*) in one way but not in another. This warning is relevant for the leading question of his present inquiry, namely, whether the principles and causes of all things are the same or different. We recall that in XII, 4 (1070a31–32) he introduced a sense in which they are the same, if one speaks universally and analogically. But now he seems to be advising caution in how one speaks universally about causes, if one wishes to avoid a Platonic error in talking about the sameness of causes. Thus Aristotle is adamant that, in every case, the primary principles (*prôtai archai*) are, on the one hand, the primary 'this' (*todi*) which is actual and, on the other hand, something else which is potential. He argues that such principles cannot be universals because the principle of an individual is another individual. While conceding that one may speak universally of 'man' as a principle, he denies that there is any such person as the universal man. Given Aristotle's predilection for the Third Man argument, I think we may take him to be making an anti-Platonic point here. Although it is possible to speak generally about man generating man, it is actually an individual such as Peleus who is the moving cause of another individual like Achilles or, schematically, the principle of *this* BA is *this* B. Such a formulation would appear to fit the material cause better, yet the anti-Platonic point is clear when Aristotle insists (1071a23) that, speaking generally (*holôs*), B is the principle of BA without qualification (*haplôs*). The point is that only particular substances may be spoken of without qualification as principles and causes, whereas universals or Forms must be carefully qualified if they are called 'causes' or 'principles'.

At this stage of his inquiry, Aristotle begins (1071a24 ff.) to draw some
[92] conclusions from his discussion of the question of whether the | principles and elements of things are the same or different. For things like colours, sounds, and quantities which fall into other genera besides substance, the causes and elements of substances are not the same except by analogy. And even within the same genus of things they are different, not specifically but individually. The examples which Aristotle gives here to illustrate this latter claim seem to involve the individuation of forms, as well as of matter. He says (1071a27–28), for instance, that your (*sê*) matter and form and moving cause are different from mine (*emê*), even though they are the same in general definition. Thus we seem to be left with the unpromising conclusion that in a general and analogical sense the principles and elements of everything are the same, while they are very different in the important specific (and most real) senses.

Such a conclusion is unpromising because it does not lead to the unifying vision of the cosmos which we might have expected from a first philosophy that is also a theology. Yet I think that we may still find some hint of that vision if we examine carefully the concluding passage of XII, 5:

> Thus, to inquire what are the principles or the elements of substances and of relations and of qualities, or whether they are the same or distinct, clearly this is possible for each of these in view of the fact that the terms are used in many senses; but when the senses have been distinguished, the principles and the elements are not the same but distinct, unless they are taken in a certain sense and are to include all things. In one sense, they are the same by analogy, in view of the fact that there is matter, form, privations, and a moving cause; and in another sense, the causes of substances are in some manner the causes of all, in view of the fact that when substances are destroyed all other things are destroyed. Moreover, the first thing which exists as actuality is the cause of all. On the other hand, there are first causes which are distinct if, being contraries, they are spoken of neither as genera nor in many senses; and, in the same way, there are first causes which are distinct as matter. We have stated, then, what the principles of sensible things are and how many they are, and in what sense they are the same and in what sense distinct.
>
> (*Met*. 1071a29–b2, trans. Apostle)

Perhaps referring here to an aporia facing the Platonists, Aristotle accepts the
legitimacy of asking a general question about whether the | principles and [93]
elements of all things are the same. But it is not immediately clear how this is related to the claim that each of these terms (i.e. principle and element) is said in many ways (*pollachôs legomenon*).[16] Aristotle seems to have in mind

[16] It can hardly be the case that the phrase *pollachôs legomenon* was also used by Plato,

that such terms mean different things for different genera, so that when these senses are distinguished the principles and elements are not the same but different (1071a32). But if these terms were simply ambiguous in different categories, there would be no real ground for saying that, in some sense, the principles and elements are the same for all. However, Aristotle must find some basis for a general inquiry into the principles and elements of being qua being, although that particular formulation of the subject-matter is not used in XII.

In the above passage, I find at least two (if not three) attempts to ground a general inquiry into the principles and elements of all things. The first (1071a33) consists of a summary of what has already been established in XII, 4 & 5, i.e. that in some analogous fashion the principles and elements of all things are the same. This analogous sameness trades on the fact that one can speak generally (*katholou*) about matter, form, privation, and moving cause in different genera. When one specifies the principles in each category, however, they turn out to be different even though the identity of the relationship is retained, just as the same proportion may be said to hold between ratios that are filled out in different ways. The second attempt at finding a way in which the principles of all things are the same has also been canvassed previously at the beginning of XII, 5. This way rests on the claim that, in some sense, one can take the causes of substances to be the causes of all things.

In my analysis of that previous passage, I argued that this claim is justified in terms of the natural priority of substance and I think we can find the same justification repeated here (1071a35) in the formulaic phrase '*hoti anaireitai anairoumenôn*'. Within the present context I take this phrase to mean that when substance is destroyed then beings in other categories are
[94] also destroyed with it. Ironically enough, Aristotle | is here appealing to a criterion of natural priority inherited from Plato (1019a1–4). The fact that priority is crucial to the argument is confirmed by his remark (1071a36) about the first thing being in a state of actuality (*to protôn entelecheiai*). Although it is not quite clear how this fits in with the claim that the causes of substance are the causes of all things, we can make a plausible conjecture by linking the priority of substance with the fact that terms like 'principle' and 'element' are said in many ways.

As it is used here, the phrase '*pollachôs legomenon*' means that these terms are simply ambiguous in different genera, by contrast with univocal terms within a single genus. From parallel passages, however, we know it

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as Elders (1972: 134) suggests, since Aristotle cites the many senses of 'good' and of 'being' as objections against Platonic claims that seem to depend on these being univocal concepts.

could also mean that, even though they have different senses (like the term 'medical'), all of these senses refer back to one central meaning. Therefore, I think that the third possibility hinted at by Aristotle here is that terms like 'principle' and 'element' can have the logical structure of *pros hen* equivocals or 'focal meanings'.[17] The principal or primary meaning of such terms as form, privation, and matter, is given with reference to substance and this, in turn, determines their application within other categories. In the present context, the significance of focal meaning is not simply its unifying linguistic function but rather its deep metaphysical implications for Aristotle. With regard to the leading question of XII, 4 & 5, it provides and alternative way (other than proportional analogy) in which the principles and causes of all things can be the same. Since the inquiry is about being, whose central and focal meaning is substance, then the principles and causes of substance range over all the categories of being.

Conclusion

A parallel solution can be found in *Metaphysics* VI, 1 (1026a30–31), where Aristotle claims that first philosophy is both a particular science and also universal precisely because it is first. It is a peculiar characteristic of the logical structure called a *pros hen* equivocal that | its primary instance is both [95] particular and universal.[18] This has an important bearing on the perennial problem in Aristotelian scholarship about whether the special science of theology can be integrated into a general science of being qua being. Despite the absence of this description of metaphysics from XII, I think there is some evidence that such a conception is present in both the analogical and focal meanings of being. For instance, these two meanings are presented as two ways in which we can say that the principles and causes of all things are the same. While the analogical sameness of the principles seems to hold only in a general manner, it would appear that *pros hen* sameness holds for both particular and universal. The latter kind of sameness provides the crucial connection between theology and general ontology, even though Aristotle does not here spell out the details. Still, I think that this is the perspective from which we should view XII, 6 with its sudden transition to an inquiry into supersensible substance. Since Aristotle does not stop to explain this

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[17] The terminology is that of G.E.L. Owen 1965. For Aristotle's treatment of 'principle' and 'element' as transcendentals, along with 'being' and 'unity', see *Metaphysics* X, 1–2.

[18] Cf. pp. 333–378 above and Cleary 1988 for a more extended defence of this claim. See also Halper 1987 for a similar claim about the primary case of being for Aristotle.

transition, commentators have often been puzzled as to how the previous inquiry into the principles of sensible substance fits in with what follows. The conclusion of XII, 5 contains a typical survey of his results about the principles of sensible things, i.e. what they are and how many, how they are the same and how they are different. The ongoing task for Aristotelian scholars is to explain the fact that he uses these conclusions as if they were stepping-stones into the realm of supersensible distances.[19]

[19] This also provides a very clear contrast with Plato in the *Republic* where mathematical hypotheses are said to function as 'stepping-stones' into the realm of supersensible Forms; see *Rep*. 510–511.

Introduction

I want to defend the slightly paradoxical thesis that Aristotle's best *polis* should not be prayed for[1] because, firstly, it is based on an unjust system of slavery, given that its citizens will depend on the labour of farmers and artisans who ought to be enfranchised if the *polis* is to be just and stable. Secondly, even that restricted *politeia* itself is internally unstable because there will always remain a potential conflict between soldiers and politicians over who should rule. In short, the best *polis* is open to some of the criticisms which Aristotle himself levels against the Spartan constitution. For instance, there is a clear parallel between the Spartan helots and the farmers/craftsmen of Aristotle's best *polis*, since both groups may be native born and yet be practically enslaved. A typical source of tension in all ancient cities was the existence of rich metics and freedmen who had acquired great personal wealth yet were still denied political rights even though they had to pay a tax and serve in the army.[2] While Athens only rarely granted citizenship to rich freedmen, Sparta usually suppressed the helots by military means, even though it drafted them as hoplites for foreign campaigns when its own citizen population was depleted. Although Aristotle is critical of defects in the Spartan constitution, yet it is closer to his ideal *polis* than even the most
[194] oligarchic Athenian constitution. So I feel justified in | using Sparta as an ancient testing ground for whether Aristotle's best *polis* is workable since he criticises Plato's proposals as utopian and promises not to propose anything impossible.[3]

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[1] Here and in my title I am playfully repeating Aristotle's words at *Pol.* VII, 4, 1325b36–40 where he describes his best polis as something one might wish for, or 'according to prayer' (*kat'euchên*). Thus, like people in prayer (*kathaper euchomenous*), the politician and legislator for the best *polis* make some prior assumptions but do not wish for anything that is impossible.

[2] In ancient Athens metics were excluded from all political offices and could not own land, yet they were subject to a poll tax and were liable for military service. See MacDowell, 1978: 76–78.

[3] Cf. *Pol.* VII, 4, 1325b38–40 & II, 6, 1265a17–18.

I

What does Aristotle have in mind when he talks about a *polis* that one might pray for, while never giving it a name or a place in his classification of constitutions? Many scholars[4] have claimed that it is merely a utopian ideal, like Plato's Kallipolis, which can exist only in the mind as a paradigm or standard against which we measure all other constitutions. Although there is some truth in the claim that Aristotle's best *polis* serves as an ideal standard, yet he criticises Plato for proposing something impossible for human beings. Therefore, when he talks about a constitution that one might wish for, it is perhaps better to understand him to be referring to the natural and chance elements in human life which lie outside our control, but which are still necessary for the realisation of the best possible constitution. Typically, Aristotle identifies such things as the landscape, the climate, and the natural disposition of the population as elements over which the legislator has little control, so that he can only pray that these will be delivered by fortune as the necessary conditions for creating the best constitution. By contrast, the legislator has greater control over the development of virtue in the citizens and, most importantly, over the distribution of offices which is integral to setting up a constitution. Therefore, I would argue that Aristotle proposes his best *polis* as something that is possible, given the right circumstances and a legislator with a vision of the highest human good. Since he applies the criterion of internal stability to his best mixed constitution or '*politeia*' in *Politics* IV, I feel justified in using the same criterion for assessing the best *polis*, which serves as a standard for all other constitutions.

In *Politics* VII, 8 Aristotle discusses the classes of human beings necessary [195]
to a city, using the general distinction between proper parts and necessary conditions. As regards communities like a city, what distinguishes proper parts from necessary conditions is the sharing together that constitutes the community. Thus the best *polis* contains as proper parts only those people who are similar in virtue and so can live together sharing the best possible life. Given the different ways that people conceive of and pursue happiness, the regimes they set up when they are in control of the city are necessarily

[4] In the twentieth century many scholars followed Jaeger in taking *Politics* VII–VIII to belong to an early Platonic phase in Aristotle's political thinking, which is described as utopian. But scholars like Rowe (1977), while accepting that the constitution described there is utopian in the sense that it exists nowhere, also insist that it is partially based on the analysis and criticism of existing constitutions.

different. For regimes differ according to the character of the ruling body, which is determined by what it thinks most worthy of pursuit. This implies that in the best *polis*, by contrast with inferior ones, not everyone who lives in the city will share in the constitution because only those who possess complete virtue will be full citizens.

In *Politics* VII, 8 Aristotle gives a list of what a city needs in order to exist, namely, food, the arts, arms, wealth, care of the gods, and judgments about the useful and the just. In VII, 9 he lists the groups of inhabitants that will provide these things, namely, farmers, artisans, warriors, the wealthy, priests, and judges. But, as Keyt (1991: 261) notes, this list is incomplete because elsewhere in *Politics* VII Aristotle refers to groups such as day-labourers, traders, and seamen. Since the best *polis* imports and exports some commodities, merchants and traders will be necessary. However, Aristotle insists on separating the commercial *agora* from the free *agora*, where citizens will conduct their leisure activities (VII, 12, 1331a30–b13). For defence of the *polis*, he concedes (VII, 6, 1327a40–b15) that a navy may be necessary but suggests that seamen might be recruited from among the classes of farmers and labourers. Obviously, Aristotle is trying to avoid having a separate class of seamen such as lived in the Piraeus, given their influential role in Athenian democracy. Yet, if farmers and *perioikoi* are drafted as seamen in defence of the *polis*, this would give them some say in political decisions, especially about waging war. In any event, I think it is clear that the merely necessary groups will far outnumber the full citizens of the best *polis*.

In essence, Aristotle's best constitution is an aristocracy of virtue in which the full citizens take turns ruling and being ruled. It consists only of three
[196] groups of citizens: the soldiers, the politicians, and the | priests. But even among the citizens one can envisage several obstacles to the civic consensus which is essential for stability. It is hard to believe that the young warriors will accept being continually ruled by the politicians on the promise that they will take their turn ruling when they become mature men. Furthermore, assuming that politicians are elected to their offices, why should those citizens who are passed over accept the judgment of their peers? In ancient Greece elections tended to be popularity contests that favoured the influential noble families or those who made public displays of wealth like Alcibiades. Of course, Aristotle might appeal to the good judgment of virtuous citizens who will elect other *phronimoi* rather than rich or daring citizens to lead them. In *Politics* VII, 3, for instance, he says that in a society of peers it is right and just that offices should be rotated on a basis of equality and parity. But he says very little about the political mechanisms by means

of which such a just distribution of offices is to be arranged. While some scholars regard this as further evidence for the utopian character of the best *polis*, I see it as a typical weakness in Aristotle's approach to practical politics.

II

Given that the best *polis* requires citizens who are noble and free, it follows for Aristotle that they should not live the vulgar life of craftsmen or the commercial life because such a life is ignoble and contrary to virtue. Neither should citizens work as farmers, since leisure is needed both for the development of virtue and for political action. However, elsewhere (*Pol*. 1281b28–38) Aristotle accepts that farmers and craftsmen may be full citizens of inferior constitutions, though not of the best *polis* because such occupations interfere with the development of complete virtue. While farmers and craftsmen do not have the leisure to become political decision-makers, still they do not lack political intelligence or spirit. So it must be the mental habits arising from producing goods for profit that hinders them from valuing the intrinsic goods.[5]

But if the farmers and craftsmen have intelligence, why can't they be [197] trained in virtue just like the soldiers and politicians? My conjecture is that Aristotle did not consider this possibility because economically it is impossible for everyone in the *polis* to have the sort of leisure necessary for the development of moral and intellectual virtues. There must be a class of producers to supply the necessities of life. Aristotle holds that full citizens should not engage in productive professions on the grounds that these occupations morally debase their practitioners, rendering them incapable of happiness which is the goal of the best constitution.[6] For example, Aristotle regards manual workers and artisans as vulgar and slavish, with souls in an unnatural condition and hence incapable of virtue.[7] Merchants are said to be acquisitive and obsessed with bodily desires, while farmers are described as

[5] Oscar Wilde has defined a Philistine as someone who knows the price of everything and the value of nothing. Ironically, Wilde was himself a middle-class Irish emigré trying to curry favour with the British aristocracy, just as Aristotle seems to adopt the social values of the Athenian aristocracy.

[6] Compare Plato's *Laws* VII 846d1–e2, XI 919d2–920c8; and Xenophon, *Oec*. IV 2–3.

[7] Cf. *Pol*. I, 13, 1260a36–b2; III, 4, 1277a37–b7; 5, 1278a17–21; VII, 9,1328b39–41; 1329a19–21; VIII, 7, 1342a22–23.

being too busy for political virtue, and as conceited and troublesome.[8] Thus, he says it would be best if farmers were without spirit, so that they would not be rebellious (VII, 10, 1330a25–30).

In addition, Aristotle displays an unreasonable bias against certain pursuits, e.g. he takes it for granted that providing goods and services for others is inferior to political activity and philosophising (I, 7, 1255b35–37). Yet he does acknowledge that a virtuous person may also perform menial services, as when a soldier digs a ditch or nurses a wounded comrade.[9] Irwin (1988a: 414–416) criticises Aristotle's inconsistency in maintaining that citizens must be soldiers, even though a purely military life can be morally debilitating. Both Irwin and Miller (1995: 245n138) wonder why Aristotle does not make the same concession for productive activities. It is strange that Aristotle never entertains the possibility that all citizens of the best *polis* could spend part of their time engaged in necessary productive activities, rather than relying on
[198] a subservient class of non-citizens. In fact, it would be more consistent | for Aristotle to rely on moral education to ensure that the citizen pursue noble activities instead of prohibiting them from engaging in productive labour due to its alleged corrupting influence.

However, he does claim (*Pol.* VIII, 2) that the purpose for which acts are done or subjects studied makes a crucial difference. For instance, anything done to satisfy a personal need, or to help a friend, or to attain virtue will not be illiberal; but the very same action, when done repeatedly on the orders of another, is regarded as menial and servile (1337b17–21). Barker (1946: 334n2) notes the parallel with the eighteenth-century English ideal of the liberal gentleman who remains an amateur deliberately, so as to avoid the loss of caste associated with becoming a paid professional. Of course, the economic reality underpinning such a social ideal is similar to that envisaged by Aristotle, namely, that of landowning gentry whose estates were worked by landless labourers, tenant farmers and overseers who ensured that the owner did not have to do anything beneath him, except perhaps some estate management (economics).

As in Plato's *Republic*, Aristotle's division of labour in the best *polis* implies that the majority are non-ideal inhabitants. Although the aim of the *polis* is to provide the good life for its citizens, the best form of *polis* is one which frustrates this aim for the majority of the population. Just like Plato

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[8] On merchants see *Pol.* I, 9, 1257b23–1258a14; VII, 9, 1328b39; on farmers see 1328b41–1329a2; II, 5, 1264a32–36; IV, 6, 1292b25–29.

[9] Cf. *Pol.* VII, 14, 1333a6–11; VIII, 2, 1337b17–21.

in the *Laws*, Aristotle tries to avoid this difficulty by delegating the necessary economic functions to non-citizens and preferably to non-Greeks, such as slaves and metics. However, this means that the whole *polis* is no longer a community as defined by Aristotle, but merely a fraction of a community, dedicated to pursuing an aim which is alien to the majority on whose labour it depends.

There is also a problem about the unity of the whole population, which is composed both of citizens and non-citizens. How can Aristotle explain the willingness of non-citizens to play their necessary role in supporting the *polis*? In the case of slaves the question does not arise for him, but what about the metics who live and work in the ideal *polis*? Why should they accept that they would be better governed by the moral elite than by themselves? Aristotle offers no explanation but perhaps he thought that, since the ideal citizens are *phronimoi* by definition, their political deliberation guarantees the best possible order in the *polis*. However, as Taylor (1995: 249) points out, the critical question | is whether this is the best arrangement for the ruling [199] elite only or for everyone, including slaves and metics. Why shouldn't the principle of rule-and-be-ruled that is applied to soldiers and politicians also be extended to producers, so as to strengthen the solidarity of the whole community? As it stands, the so-called best *polis* is not a political community at all, since it is not self-sufficient for life, much less for the good life (1252b27–30). Instead, it involves an exploiting elite, whose pursuit of the good life is made possible by others who are forced to sacrifice that goal, as Aristotle himself objects against Plato (*Pol*. 1264a22–40).

The presence of so many foreigners in the best *polis* is also potentially destabilising, even if Aristotle tends to play down the risk of revolution among the slaves and *perioikoi*. Typically, the *perioikoi* had fewer rights than a citizen but more than a slave, yet Aristotle does not specify the nature of these rights. Presumably his reason for thinking that it is better to have slaves rather than *perioikoi* doing the farm work is that it is easier to control them or prevent them from revolting. In Sparta and Thessaly, attacks on the city by helots and *perioikoi* were frequent (II, 9, 1269a36–b7), and Aristotle seems to have such dangers in mind at *Pol*. VII, 10 when he says that it will be easier to avoid rebellions if the farm workers are slaves. At VII, 14, 1332b29–32, however, he implicitly accepts that the *perioikoi* will remain a potentially revolutionary force within the ideal *polis*. At II, 9, 1269b7–11 he describes the problem of control in general as one of finding the mean between excessive leniency and excessive harshness. In his criticism of Plato at II, 4, 1262a40–b3, Aristotle suggests that it would be better to dismantle the family structure among farmers than among guardians because that would diminish affection among

them and make them less likely to revolt. The basic intention is to prevent social cohesion among a subordinate group. Therefore, Aristotle implicitly admits that the *de facto* enslavement of the farmers and craftsmen remains a potential threat to the stability of the best *polis* but, since he does not regard this state of affairs as unjust, he still advocates it because it is a necessary condition of the leisure enjoyed by the full citizens.

Friendship is one of the bonds of political community, whether that be the highest form of friendship, which is possible only between a few equals,
[200] or political friendship based on expediency and usefulness, | which would be possible among many equals and even among those unequal in virtue. But is any kind of friendship possible between the masters/rulers/citizens and the slaves/farmers/artisans whose products are being appropriated by the citizens to support their leisured life of civic activity? If there should arise enmity between the property-owning citizens and the propertyless farmers and artisans, then there would exist a radical tension within the so-called best *polis*. These different interest groups do not have any common advantage which might unite them but rather have many reasons for hostility and disunity.

III

Let me now briefly consider Aristotle's account of how civic functions within the best *polis* are to be distributed, namely that the young free men will be the soldiers who defend the *polis* and who are always ruled by politicians. The latter are the mature men of the same class who take turns ruling and being ruled, while the elderly men become priests and take care of divine matters. But, as Mulgan (1977: 95) has pointed out, there is a theoretical difficulty about this division, as only the politicians will be full citizens, since they share equally in the deliberative and judicial offices. By contrast, the young warriors are only partial citizens, in that they are ruled by politicians, but will not take their turn at ruling until they become mature men. Aristotle himself seems to concede this much with his distinction between those of military age and those who share in the constitution (*Pol*. VII, 10, 1329b36–37).

The young warriors are characterised above all by *thumos*, which may be described as spiritedness, love of honour, anger and even desire. But *thumos* is a double-edged sword, as it can also involve a desire for domination over others, and hence may lead to civil war (*stasis*), if others in the *polis* are equally driven by *thumos* to dominate or even to resist domination. Aristotle appears to be aware of this problem when he refers to Plato's view that the

guardians must be friendly towards those whom they know, while being fierce towards those they do not know. He agrees with Plato that *thumos* is the capacity of the soul by means of which we love (and hate), as evidenced by the fact that when slighted our spirit is roused more against acquaintances
[201] and friends than against those we do not know. Both the activities of | ruling and of being free derive from *thumos* because spirit is a ruling element and resists domination (*Pol.* 1328a6).

But Aristotle does not agree with Plato that the guardians should be harsh towards those they do not know. He argues that this is not the way one should treat anyone, and in any case great-souled men are not by nature fierce, except towards wrongdoers. If they consider themselves to be wronged by anyone they feel angry, but justifiably more so if wronged by their acquaintances. Hence the wisdom of the old tragic sayings: 'The battles of brothers are harsh', and 'It is those who have loved beyond measure who will hate beyond measure' (*Pol.* 1328a15–16). So Aristotle clearly acknowledges the dangerous power of *thumos* in the *polis*, but it is doubtful whether his system of education can ensure that spirited young warriors will accept being ruled by the politicians, and thereby restrain their natural desire for domination. Yet perhaps he does not rely so much on formal education as on the informal power of custom or law to inculcate the right attitude towards the authority of the politicians in the young soldiers, given that they must obey their leaders in the army.

However, it is also possible that military institutions like common meals are being introduced into the best *polis* so as to promote social solidarity. Aristotle never fulfils his promise to give his own reasons for favouring common meals, but his reference in *Pol.* II, 5 to the *syssitia* of Sparta and Crete suggests that he values this institution both for its unifying and educational role in the *polis*. Having criticised Plato for abolishing private property, he appeals to the time-honoured practice of common meals as an educational arena for the citizens, and as a more reasonable way for citizens to share their possessions (1263b31–1264a1). So we may assume that Aristotle favours common meals because they contribute to virtue and good relations among the citizens. The ideal *polis* with its special goals needs institutions that foster affective ties among its members, since it is a community in the strong sense of being bound together by a sense of fraternity, For Aristotle the political *koinonia* is a genuine community, and the common meals represent one of the bonds that held such ancient communities together.

The maxim of unanimity is a central feature both of the best constitution and of the second-best mixed constitution. Aristotle holds that | the latter is [202] inherently stable because it is well mixed, and stability results from institu-

tional justice.[10] Miller (1995: 269) claims that the connection between justice and stability is clarified by a practical principle regarding the preservation of constitutions, which he calls the maxim of unanimity, i.e. political friendship as described at *EN* IX, 6, 1167a26–b4. With reference to the Spartan constitution, Aristotle says that if a constitution is going to be preserved all the parts ought to wish that it exist (*Pol.* II, 9, 1270b21–22).

A negative version of unanimity principle is implicit in VII, 9, 1329a9–12 which says that the *polis* should not contain armed enemies because they have control over whether the constitution lasts or not. Aristotle's safeguard is to make the soldiers a proper part of the *polis*, but how does he ensure that they will submit to political rule and not seize power? He cannot simply assume that the soldiers will have complete virtue, since all Aristotle can pray for is the natural virtue of the young men who will be required to serve in the army.[11] Thus the unity and stability of the best *polis* depends on the public education which he prescribes for all the citizens.

IV

Part of Aristotle's solution to such problems (about unity and solidarity) is his emphasis upon the training in virtue that is necessary for the good citizens who constitute the best *polis*. He sketches an educational system which is designed to inculcate the appropriate civic virtues, while he also makes critical remarks about the Spartan system because it promoted only military virtue. But, given the large slave population needed to support Aristotle's best *polis*, perhaps the most essential virtue for its citizens will be military courage, in order to defend its constitution against internal threats. Thus his best constitution is subject to the same criticisms as the Spartan, unless he can show how complete virtue is to be developed.

[203] Let me outline the practical problems facing Aristotle. Since the | soldiers will first develop courage without *phronesis*, they must listen to the rulers who have practical wisdom, if they are not to abuse their powerful position in the *polis*. But, just as with the problem of slaves lacking reason, how can the soldiers be persuaded to listen unless they already have developed the capacity for practical reasoning? The politicians rule not only over the free citizens (political rule), but also over unfree farmers and artisans, who are

[10] Cf. *Pol.* IV, 2, 1297a6–7 & V, 7, 1307a26–27.

[11] Aristotle himself admits that only a few people will ever acquire full virtue; the majority aspire only to military virtue (*Pol.* III, 7, 1279a39–b2).

de facto slaves (tyrannical rule). Yet these productive classes represent a significant proportion of the population, who are working to provide the necessities for the leisured classes that guard or rule the *polis*. Even if the best *polis* will not be involved in foreign conflicts, the soldiers and politicians must combine to keep control over the producers who are denied citizenship, as well as the fruits of their labour. So how does the best *polis* differ in practice from ancient Sparta?

In *Politics* VII, 14 Aristotle wonders whether the rulers and the ruled should be permanently separated or unified, as this has a large bearing on education in the *polis*. He answers that rulers should be permanently separated only if one group, like gods or heroes, should surpass all others both physically and mentally, so that their superiority is evident to everyone and is accepted by all. But Aristotle rejects that possibility for ordinary cities where there is not such a gulf between kings and subjects. So he concludes that all should share alike in a political system under which they rule and are ruled in turn. In a society of peers, justice means that all should have the same rights. Otherwise, a constitution founded on injustice may be destroyed by revolution. Here Aristotle seems to recognise this as a permanent danger in any *polis* where there is actual or perceived injustice.

But since there must be some difference between governors and governed, the legislator faces the dilemma of how citizens can differ and yet share alike. Aristotle refers back to his previous suggestion (VII, 9) that ruling and fighting are suitable for different stages of life, i.e. that deliberation needs the wisdom of maturity, while war needs the vigour of youth. Aristotle there explicitly recognised that control of military power determines the future destiny of a constitution. So his solution is to vest the powers of ruling and fighting in one and the same group of citizens at different ages, according to the order of nature. At *Pol*. VII, 14 he returns to this 'natural' solution, namely, since the citizens | fall naturally into younger and older groups, the first should be [204] governed and the latter should be governors. According to him, youth never resents being governed, or thinks itself better than its governors, and it is unlikely to be resentful if it can look forward to governing some day.

Thus, with regard to the education for all citizens, Aristotle concludes that from one point of view it will be the same but from another perspective it will be different. By way of support, he quotes the old adage: 'If you would learn to govern well, you must first learn how to obey.' He contrasts two ways of governing: (a) in the interests of the governors, i.e. despotic rule; (b) in the interests of the governed, i.e. political rule. Hence the young must learn to be governed like freemen, yet paradoxically they must obey orders which seem more appropriate to the government of slaves. To avoid the

apparent paradox, he makes a subtle distinction between the work itself and the purpose of the work, so that work which is generally regarded as menial can be the sort of work which young freemen can perform honourably. It is not the inherent nature of the actions, but the end or purpose for which they are done, which makes an action honourable or dishonourable.

Thus Aristotle's best *polis* is, in effect, rule by virtuous aristocrats, whose undeclared enemy within the *polis* are the productive classes of farmers and craftsmen. In order to stabilise such a constitution, Aristotle must legislate for an educational system that develops completely virtuous (cooperative not competitive) citizens, who take turns ruling and being ruled. His criticism of the Spartan military education shows that he wants to avoid the excessive emphasis on military courage, which is central to the old Homeric notion of virtue. But his very sketchy system of education provides only vague suggestions as to how complete virtue might be inculcated in the citizens. For instance, it remains unclear how the 'images' of virtue that are conveyed by music can help to achieve Aristotle's very ambitious goals. Obviously, he is just as concerned as Plato with the models of virtue being held up to the young people by poets like Homer and other cultural educators. But he has not shown how the natural virtue of the young warriors is to be developed into the complete virtue of the mature politicians.

The ultimate purpose of war is peace, just as leisure is the ultimate goal of
[205] business. But can the citizens who are ruling over a slave population | ever enjoy complete peace, even if there are no external enemies? It is unjust to subjugate those who neither want nor deserve to be subjugated. According to Aristotle, however, subjugation and domination are conditions of natural law, i.e. some people are born slaves, others are natural rulers, so that this is a just arrangement (*Pol*. VII, 2, 1324b36–37). But Aristotle's arguments for natural slavery are notoriously weak and, in any case, it is difficult to see how all the productive classes can be natural slaves and still perform all their essential tasks in the best *polis*. Furthermore, the continual threat of a slave revolt will make the *polis* excessively dependent on the young warriors, whose honour-loving *thumos* may lead them to desire a greater share in ruling.[12]

[12] In ancient Greek a desire for honour (*timê*) implies a desire to hold office (*timê*) in the city.

Conclusion

There is a clear parallel between Aristotle's attempt to justify slavery as natural and his proposal for an ideal *polis* as a natural arrangement, i.e. that the young naturally tend to obey their elders, and that mature men are naturally better at deliberating; and that farmers and craftsmen are naturally banausic and should not be given any control of the *polis* or even of the resources which they produce. The same forces of economic necessity in ancient Greek society that led Aristotle to defend slavery as natural also led him to propose an enslaved productive class which is forced to support an elite leisured class. Since there is no other way such an unproductive class could be supported, it must be defended as just by the same kinds of arguments as he used for natural slavery, i.e. the superiority of the soul over the body, of reason over desire.

But I submit that such a political arrangement is unjust and that it will create the same kind of internal instability as the Spartans experienced in trying to suppress their helots. The Messenians were 'state slaves' like the farmers and craftsmen of the best *polis*, especially those working the public lands which are set aside to support the priests and the military. Just as each year in Sparta the newly elected ephors took an oath to fight the helots as if they were the enemy, so the | best *polis* will have a permanent enemy within [206]
its walls. Aristotle tries to guard against this danger by making all the slaves be foreigners, who will presumably be natural slaves; but this precaution does not work if his argument for natural slavery does not work.[13] And there is another potential enemy within the walls, namely the military, which is subordinate to the politicians. Aristotle recognises that the young men in the army are often forced to do menial work and take orders like slaves, though he insists that this is political and not despotic rule. Since the army poses a greater threat to the constitution than foreign slaves, Aristotle proposes to conscript only young citizens who can reasonably be expected to accept the temporary position of subordinates because they will eventually get to rule when they become mature men. But the historical reality in contemporary Greece was the increasing use of mercenaries, whether Greek or barbarian, to replace the old-style citizen army.[14] Sparta and Thebes were perhaps the last great military powers to depend on a citizen army, while the trend everywhere was towards paid mercenaries, who were often led by ambitious generals like Philip and Alexander of Macedon. Yet Aristotle appears to be unaware

[13] See Smith 1991 for a critical analysis of Aristotle's arguments in support of natural slavery.
[14] See Davies 1993, ch. 13.

of this new threat to the Greek *polis* when he recommends a return to the old-style citizen army which is to be educated in all of the virtues, so as to avoid the inadequacies of the Spartan education in military excellence.

EMENDING ARISTOTLE'S DIVISION OF THEORETICAL SCIENCES

[33]

Modern Aristotelian scholarship is heavily indebted to the German scholars of the nineteenth century who produced the Berlin Academy editions of Aristotle's corpus and of his Greek commentators. The foundations for this massive project were laid around the middle of the century by people like Schwegler, who edited and commented on Aristotle's *Metaphysics*.[1] Yet, while acknowledging our debt to such exemplary scholarship, I want to cast doubt on one of his proposed emendations to *Metaphysics* VI, 1, which influenced later editors like W.D. Ross and Werner Jaeger.[2]

This paper will reexamine Schwegler's proposal with reference to Aristotle's tripartition of theoretical knowledge, which itself exerted considerable influence on Neoplatonic and medieval thinking about the divisions between the sciences. Philip Merlan (1954) has noted how the division of theoretical philosophy into theology, mathematics, and physics is linked by both Iamblichus and Proclus with the Platonic tripartition of being. On this basis he argues that Aristotle's tripartition of the theoretical sciences is a leftover inheritance from Plato, which does not really fit with his own bipartition of substance into sensible and supersensible. By contrast, I will argue that this is inconsistent with those passages where Aristotle clearly commits himself to a threefold division of theoretical sciences in terms of the mode of being of their objects of inquiry. In the face of Merlan's charge that this division is
[34] inconsistent, my task is to give a reading of these texts | which will reconcile Aristotle's tripartition of theoretical sciences with his anti-Platonic ontology.

Specifically, I will explore the question of how Aristotle can posit a general science of philosophy alongside the special sciences, without accepting the Platonic notion of a master science with its own distinct realm of objects. According to the *Posterior Analytics*, every science has its own subject-genus which is assumed to exist and is defined at the beginning of an inquiry, which then demonstrates that certain *per se* attributes belong necessarily to that subject. What is unclear, however, is how these subject-genera of the sciences are to be correlated with the natural divisions of reality as

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[1] See *Die Metaphysik des Aristoteles*, ed. A. Schwegler, 1847–1848.

[2] See *Aristotle's Metaphysics*, ed. William D. Ross (1924); and *Aristotelis Metaphysica*, ed. Werner Jaeger (1957).

Aristotle understands it. For instance, can they be correlated with the highest genera in the *Categories*? One might try the following hypothesis: physics and metaphysics deal with the category of substance, while mathematics deals with the category of quantity. This, however, will not do because we have no way of distinguishing between physics and metaphysics if they both deal with the category of substance. Indeed, it is significant that Aristotle does not appeal directly to his own categories when he distinguishes between the theoretical sciences in terms of their subject-genera.

I

In *Metaphysics* IV, 1 Aristotle discusses the possibility of a general science of metaphysics, which investigates the principles and causes of being qua being. His guiding assumption (1025b5–7) is that every theoretical science is concerned with principles and causes, though the special sciences study only a particular genus of being rather than being simpliciter (ἁπλῶς) or being qua being (ᾗ ὄν).[3] Furthermore, they do not give any account of 'the whatness' (τὸ τί ἐστιν) but | merely assume it or make it clear by perception. Aristotle [35]
concludes that such an induction[4] does not constitute a demonstration (ἀπόδειξις) of whatness but is rather another way of clarifying this principle. Similarly, he insists, the particular sciences say nothing about the existence of the genus they study, since it belongs to the same rational capacity (διάνοια) to clarify the what-it-is (τὸ τί ἐστιν) and the if-it-is (εἰ ἔστιν) of a genus (1025b6–18). The implicit suggestion is that his proposed science of metaphysics will clarify these foundational questions, which were also discussed in *Posterior Analytics* II, 1–2.[5]

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[3] A parallel passage in *Met*. IV, 1 1003a21–26 distinguishes metaphysics from particular sciences like mathematics on the grounds that it studies being qua being in a universal manner (καθόλου), whereas the particular sciences cut off parts of being and study the attributes that belong to their particular subject-genera. As we might expect from *An. Post*. I, 4, however, Aristotle goes on to insist that there must be some nature (φύσις) to which the highest principles belong *per se* and not accidentally in order for there to be a single science of being qua being. See also *Met*. XI, 3, where the universality of first philosophy is stressed and contrasted with the particularity of physics and mathematics.

[4] Despite the ambiguity of the Greek word order here, it is most likely that induction is a general way of referring to the previously mentioned ways of obtaining principles for the particular sciences. When taken in this way, the passage says that induction is not a demonstration of the whatness but rather an alternative way of making it clear (*EN* VI, 3, 1139b27–31). In reference to the above-cited passage from the *Metaphysics*, Robert Bolton (1991) claims that for Aristotle induction is an inferential procedure of establishing first principles.

[5] John Rist (1989: 54) also takes the science of metaphysics to be concerned with these

First he discusses the theoretical science of physics, which deals with the sort of being that has in itself a principle of motion and of rest, by contrast with the practical and productive sciences in which the moving principle is
[36] either in the agent or in the artist.[6] Physics is | also distinguished from other theoretical sciences inasmuch as it inquires about the kind of being which is subject to change. For the most part, Aristotle says, it studies substance in the sense of form (οὐσία … κατὰ τὸν λόγον), but only as inseparable (οὐ χωριστὴ μόνον) from matter (1025b26–28).[7] I see this passage as giving implicit answers to the what-it-is and if-it-is questions with regard to the objects of physics. For instance, his answer to the if-it-is question here is that the definable essences of physics have a mode of being that makes them inseparable from sensible matter.[8] This, in turn, dictates his answer to the what-it-is

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questions. Joseph Owens (1962: 288) thinks that Aristotle distinguishes the science of Being qua Being from the other sciences by virtue of the fact that they only demonstrate accidents, and not the Entity or what-is. He takes this to mean that this science will 'demonstrate' Entity, despite Aristotle's disclaimers about the possibility of demonstrating first principles; see, for instance, *An. Post.* II, 7, 192b10–14. But surely Aristotle cannot hold metaphysics to be demonstrative in any syllogistic sense, given that part of its task is to discuss the principles of the special sciences and common principles which are described as 'unhypothetical' (ἀνυπόθετον); see *Met.* IV, 3 and XI, 4.

[6] Edward Halper thinks that Aristotle makes the possibility of physics being a theoretical science depend on its seeking knowledge of formulas and essences, by contrast with practical and productive sciences which are oriented toward actions and artefacts, respectively. See Edward Halper 1989: 4. The Greek itself, however, suggests that the differentiation between theoretical, productive, and practical sciences depends on the location of the principle of motion: for practical sciences it is in the agent; for productive sciences it is in the artist; and for physics it is in the natural thing itself which is a composite of matter and form.

[7] Following Ross's reading of this difficult passage. The Platonic justification for differentiating some sciences as theoretical was that they contemplated the eternal Ideas or Intermediates, as distinct from the sensible and changing things of this world. Aristotle, however, makes a science of such changing things possible by distinguishing between the material and formal objects of physics, as he does here. One of his reasons for calling physics a theoretical, rather than a practical or productive, science is that it seeks 'the why' (τὸ διότι) by means of causes and principles (such as whatnesses) and not just the fact (τὸ ὅτι) or the how (*EN* 1095a5). In brief, the aim of a theoretical science is knowledge, while that of a practical science is action (*Met.* 993b30).

[8] Thus I take *Met.* IV, 1 to be differentiating between theoretical sciences in terms of the mode of being of the essences, as determined by their relationship to some kind of matter. In *Met.* VII, 6, with regard to the question of whether each thing and its essence are the same or different, Aristotle emphasises that knowledge of each thing involves knowing its essence (1031b5–6, 18–21). Within the same context, he concludes that each primary and self-subsistent thing (such as Platonic Forms were held to be) is one and the same as its essence (1032a4–5). This means that such essences can be known by first philosophy without reference to any material substratum, by contrast with physical and mathematical essences which involve some reference to matter either by addition or subtraction.

question, namely, that a physical essence typically implies a capacity for change that makes it dependent on sensible matter.[9]

Thus Aristotle underlines the priority of the if-it-is over the what-it-is question in the following methodological remark: 'We must not | overlook [37] the mode of being of the essence and[10] the definition of an object of physics, otherwise the inquiry will not achieve anything' (1025b28–30). What Aristotle seems to have in mind is the mode of being (πῶς ἐστὶ) of the form that is expressed by a definition of the essence (τὸ τί ἦν εἶναι).[11] Here the words οὐ χωριστὴν describe the mode of being of physical forms as not separable from sensible matter, and within the same context their meaning is clarified in terms of the subsequent distinction between the snub (τὸ σιμὸν) and the concave (τὸ κοῖλον). The difference between the definienda is that the snub is bound up with matter (συνειλημμένον μετὰ τῆς ὕλης), whereas the concave is without sensible matter (ἄνευ ὕλης αἰσθητῆς, 1025b32–33).[12]

Aristotle here uses snubness as the paradigm case of a physical form whose special relationship to sensible matter is reflected in its definition, that is, the

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[9] Perhaps Aristotle is here rejecting the Platonic assumption that any object of scientific knowledge must be distinct and separate from sensible things because the latter are subject to changes of all kinds. By insisting upon the connection of physical essences with sensible matter, Aristotle is including a principle of change within the subject-matter of the science of physics. More importantly, he insists that form is the chief principle of change when it is embodied in the appropriate kind of sensible matter (*Met*. VIII, 4, 1044a32–b2).

[10] I take the καὶ to be epexegetic in the passage. Even though substance in the sense of essence has for Aristotle a definite ontological status, its logical status as reflected in definition is what seems to be in question here. For instance, the logical connection of physical forms with sensible matter implies that the mode of demonstration in physics is that of hypothetical necessity, as distinct from absolute necessity which is the mode appropriate to sciences like mathematics that deal with unchanging objects.

[11] Susanne Mansion (1946: 209) tries to clarify the 'if-it-is' and 'what-it-is' questions in terms of the medieval distinction between essence and existence, and she concludes that the existence involved in the 'if-it-is' question is that of individuals, though understood in an abstract and indeterminate way. I agree with Owens that the medieval distinction is not identical with that made by Aristotle, because the 'what-it-is' cannot be known before the 'if-it-is', whereas Aquinas follows the Arabs in thinking that one may know the essence of something without knowing whether or not it exists. See Owens 1962: 288–293. The point emerges more clearly if one accepts John Rist's suggestion (1989: 99) that τὸ τί ἦν εἰναι might be better translated as 'realised nature', which presupposes its mode of being.

[12] This independence must be either logical or conceptual, because Aristotle does not believe that there is a Form of Concavity Itself which is ontologically independent of all its instantiations in the sensible world (see *Met*. VII, 13–15). Schwegler, however, takes the concave to represent an object of metaphysics by contrast with the snub which is clearly an object of physics. See Schwegler, *Die Metaphysik des Aristoteles*, 3: 2. This seems difficult to reconcile with Aristotle's frequent use of the concave as a typical mathematical object.

snub is a concave nose.[13] Thus, as he says, it | is clear how one ought to seek [38]
the what-it-is (τὸ τί ἐστι) in physical things and how one ought to define it (1026a4–5). In other words, the definition of any natural form coming under the genus of animal or plant must include some reference to change, since it is always related to matter (ἀεὶ ἔχει ὕλην, 1026a3). So the definition reflects the mode of being of the essence insofar as it has a necessary connection with a certain kind of matter; for example, snubness is always concavity in a nose and the nose is a certain form in flesh and bone.[14] These seem to be the relevant grounds for Aristotle's claim that the science of physics deals for the most part with the kind of substance which, with respect to definition, is inseparable from matter (οὐ χωριστὴν, 1025b27–28). Thus, when he says at 1026a5–6 that physics will study those parts of soul which do not exist without matter (ἄνευ τῆς ὕλης), he seems to suggest that some other science must inquire about any parts of soul that are separable from matter.

Within his discussion of the mode of being of physical forms, however, it appears that Aristotle is using χωριστός in a logical sense when he underlines the importance for every inquiry of clarifying the mode of being of the essence being studied (1025b28–30).[15] For instance, the character of physics as a science is determined by the fact that it studies natural forms as internal
[39] principles of change which are integrally | related to certain kinds of matter. By parallel reasoning, perhaps the character of mathematical inquiry may also be determined by the logical relationship that its objects of inquiry have with some kind of matter.[16] Although Aristotle does not spell out any such

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[13] From a historical perspective, the choice of 'the snub' as a paradigmatic physical form may represent Aristotle's little joke at the expense of the Platonists, perhaps reminding them that Socrates never separated the universal. I owe this plausible suggestion to Hans-Georg Gadamer 1980: 212.

[14] It seems to be this logical connection which gives rise to the difficulties associated with definitions 'by addition', which Aristotle discusses in *Met.* VII, 4–6. While he insists that definition and essence in the primary and simple sense belong to substance (which would be studied by metaphysics), he concedes that there is a secondary sense in which composite things like a snub nose can have a definable essence (1030b25–26). See J.E. Hare 1979.

[15] By contrast, recent accounts of χωριστός emphasise its ontological sense as a criterion of substance, whether it is interpreted as 'independent existence' (Fine) or as 'outside the ontological boundaries of' (Morrison). See Fine 1984, Donald Morrison 1985a, 1985b. These senses are not quite appropriate for a discussion of theoretical objects, and so I regard the logical sense as being more relevant for discussions of definition and knowledge. Further, on the meaning of χωριστός, I accept Fine's reasons for taking it to involve an implicit modal claim, so that it is better translated as 'separable' rather than as 'separate', as Morrison would have it.

[16] In *Met.* XI, 4, Aristotle says that mathematics cuts off a part of its proper matter (ὕλη) and conducts an inquiry about such things as lines or angles or numbers. By contrast with

relationship here, he leaves the possibility open when he says that concavity is without sensible matter (1025b33–34). From this brief remark it is not clear whether concavity is logically related to another kind of matter or whether it is completely independent of matter. Given Aristotle's remarks elsewhere (in *Metaphysics* VII, 10–12) about the relationship between intelligible matter and mathematical forms, the first alternative is at least plausible.[17] Later in *Metaphysics* VI, 1, for instance, he says that mathematical inquiry is about things which are perhaps not separable but have a mode of being as in matter (οὐ χωριστὰ δὲ ἴσως ἀλλ' ὡς ἐν ὕλῃ: 1026a15). If he is referring to intelligible matter, this would throw a different light on the tripartition of theoretical sciences.[18]

From his preliminary discussion in *Metaphysics* VI, 1, therefore, we may [40] extract the working hypothesis that Aristotle distinguishes between the three theoretical sciences in terms of the relationship which the essences studied by them bear to matter.[19] For instance, physical forms like snubness have a necessary connection with special kinds of sensible matter in which they are embodied, and this fact must be reflected in the characteristic definitions of physics. By contrast, mathematical forms have no such connection with

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philosophy, it does not study them qua being but rather qua continuous in either one, two, or three dimensions. Here Aristotle seems to be using ὕλη in the sense of subject-matter, which is closely linked with dimensional continuity in the case of geometry. Of course, as Aubenque points out, doubts about the authenticity of *Met.* XI are simply reinforced by its unusual use of terminology, as well as by the identification of the science of being qua being with first philosophy and with theology. See Pierre Aubenque 1962: 40.

[17] Among the puzzles listed in *Met.* XI, 1, there is one (1059b14) which asks which science should explore the puzzles concerning the matter of mathematical objects (περὶ τῆς τῶν μαθηματικῶν ὕλης). Aristotle goes on to explain that this cannot be the task of physics, since its whole subject matter is concerned with things which have an internal principle of motion and rest. Nor can it be dealt with by the science of analytics, since that concerns itself exclusively with proof and knowledge. He therefore concludes that the puzzles about mathematical matter must be considered by first philosophy (*Met.* XII, 4).

[18] One Aristotelian approach to geometrical objects is to treat them as compounds of form and intelligible matter, namely extension in one, two or three dimensions. See Ian Mueller 1970. While admitting that this is the case, Charlton thinks that Aristotle was wrong to apply his matter/form explanation in terms of actuality and potentiality to mathematical forms, since 'triangle' seems to be a universal rather than a composite of matter and form. See William Charlton 1980. This is to second-guess Aristotle rather than to explain what he had in mind when talking about intelligible matter, however.

[19] My hypothesis is not indebted to the Thomistic theory of separation (metaphysics), combined with addition and abstraction (physics and mathematics), though I would not rule this out as a possible interpretation of Aristotle's text. See Aquinas 1955, ed. Decker, q. 5, a. 3. However, I would discount Auguste Mansion's interpretation (1945) in terms of three degrees of abstraction, since it fails to account for the fact that Aristotle's use of abstraction terminology is confined to mathematical objects.

sensible matter and hence some mathematical sciences treat their objects of inquiry qua unchangeable and qua separable (ᾗ ἀκίνητα καὶ ᾗ χωριστὰ, 1026a9–10),[20] though Aristotle leaves open the question of whether or not mathematical objects are unchangeable and separable entities (1026a7–10). This remark about mathematics contains an implicit distinction between the material and formal objects, namely, that while some of these sciences treat their (formal) objects as if they were unchanging and separable, this is not the ontological status of their (material) objects. A discussion of the ontological status of mathematical objects is postponed, however, presumably to *Metaphysics* XIII, 1–3.

Significantly enough, it is just at this point in the text that we find the tripartition of the sciences being introduced in the following hypothetical manner:

> If there is something eternal and unchangeable and separable, then it is obvious
> [41] that knowledge of it belongs to a theoretical science. Yet it is | not physics (because that science is about some changeable things)[21] nor is it mathematics but some science prior to both. For physics deals with inseparable and not unchangeable things, while some of the mathematical sciences deal with unchangeable things which perhaps are not separable but are as in matter. First philosophy, on the other hand, is about separable and unchangeable things. (*Met*. VI, 1, 1026a10–16, my trans.)

What is clear from the protasis of the introductory conditional is that the character of a science is determined by the mode of being of its objects, since Aristotle concludes that there must be some theoretical science dealing with eternal and unchangeable things if such things exist.[22] Such a science cannot be physics, which treats of changing or moving things, nor can it be mathematics, but must rather be some science that is prior (προτέρας) to

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[20] Instead of ᾗ χωριστὰ here Schwegler proposes that we read μὴ χωριστὰ, presumably by way of parallel with 1026a15 where some mathematical sciences are said to study unchanging but not separate things that perhaps are as in matter. See Schwegler, *Die Metaphysik des Aristoteles*, 4: 3. Ross rightly rejects the proposal, though he does not see that the same presupposition also underlies Schwegler's other emendation, namely, that χωριστὰ always refers to the ontological separation of substances; see Ross, *Aristotle's Metaphysics* I: 355.

[21] Both Jaeger and Ross have bracketed this explanatory clause in their editions, presumably as a marginal note that does not fit well with the structure of the whole sentence. While the clause could be an interpolation, one suspects that these editors' decision to bracket it is influenced by their acceptance of Schwegler's reading of the subsequent sentence.

[22] Halper (1989: 7) argues that Aristotle is not trying to establish the existence or nature of the objects of metaphysics (hence the hypothetical form of argument) but rather is offering an indirect *a fortiori* argument for theology as theoretical, while taking physics and mathematics to be theoretical.

both. This claim about the priority of his projected science looks rather *ad hoc* because the previous discussion has not really prepared the way for its introduction.[23]

For an explanation, therefore, we must look to the subsequent distinction between the theoretical sciences in terms of their characteristic objects of inquiry. In order to understand that distinction properly, however, we must take it as being guided by Aristotle's search for the theoretical science that is most appropriate for dealing | with objects that are eternal, unchangeable, [42] and separable. It turns out that physics is the least appropriate because it inquires about objects that are inseparable[24] and also changeable.[25] By

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[23] Drawing on *Met*. VII and XII, together with the *Physics*, Kirwan gives some Aristotelian reasons for holding changeless and separate things to be prior, i.e. they are individuals which are also substances, as well as being unmoved movers. See *Aristotle's Metaphysics* IV, V & VI, trans. Christopher Kirwan, 187. But the first two reasons could also be used to argue for the priority of physical objects and, in any case, none of them is mentioned here in support of Aristotle's claim about the priority of the science of such objects. Perhaps this claim can be clarified with reference to *Met*. IV, 2, 1004a2, where Aristotle says that there are as many parts of philosophy as there are spheres of being, so that among them it is necessary that there should be something first (τινα πρώτην) and something subsequent (ἐχομένην). Merlan (1954: 60) cites this passage along with *Phys* II, 7, 198a29–31 as evidence that Aristotle accepted Plato's tripartition of being, but I think it is more likely to reflect his own mature ontological views.

[24] I am reading ἀχώριστα with the best MSS tradition (codd. and Alc), despite the fact that Schwegler's emendation (χωριστά) is widely accepted by modern editors like Christ, Ross, and Jaeger. Against this emendation, see Otto Apelt 1891: 231, D.R. Cousin 1940: 495–496, E. Trépanier 1946: 206–209, Owens 1962: 296n44, Giovanni di Napoli 1953: 180, M. Wundt 1953: 49, Vianney Décarie 1954: 466–468, Terence Irwin 1988: 544n42, Edward Halper 1989: 258–259 and H.G. Zekl 1990: 85n94.

[25] Merlan (1954: 71–72) argues against Décarie's translation of μὲν ἀλλ' οὐκ as 'et non' on the grounds that it ignores the sense of contrast which originally led scholars to reject the MSS reading of ἀχώριστα. Similarly, Ross thinks that the balance of the sentence demands Schwegler's emendation, otherwise it would contain a false antithesis; see Ross, *Aristotle's Metaphysics* I, 355. Apelt 1891: 231 however, plausibly defends the traditional reading by arguing for a different contrast in the passage between the objects of first philosophy (separate and unchanging), and those of physics (inseparable and changing) together with those of mathematics (unchanging but not separable). Thus, as Décarie points out, the general contrast would be between objects that are completely separable from matter and those that are not. It is grammatically possible to read ἀχώριστα because ἀλλά is not always adversative, even with μὲν; see J.D. Denniston, 1934: 21. Incidentally, in revising Ross's translation of the *Metaphysics*, Jonathan Barnes seems to return to the manuscript reading for this passage. By contrast, Heinrich Happ (1971: 566n26) accepts Schwegler's emendation as an improvement on the MSS reading from the linguistic and contextual point of view, and he refers to Merlan's treatment as definitive, even though it involves taking χωριστός in two different senses within the same context. But it is clear that Schwegler's emendation was motivated by the *Categories* view of substance when he paraphrases as follows: 'aber während es die Physik mit Einzeldingen zu thun hat, aber mit beweglichen (περὶ χωριστὰ μὲν ἀλλ' ἀκίνητα), hat es die Mathematik

[43] contrast, | mathematics seems to be a better candidate because at least some of these sciences deal with objects which are eternal.[26] Aristotle seems doubtful, however, about whether any mathematical objects satisfy the separability criterion because they appear to have a mode of being that connects them with some kind of matter. He therefore concludes that, if there are separable and unchangeable objects, then there will be a prior science that deals with them.

If this tripartite division of theoretical sciences is to remain consistent, however, we must assume that χωριστός refers to logical separability whenever it is used in this passage. Otherwise, we shall have to accept Merlan's claim that it is inconsistent because it contains two principles of division, one epistemological and the other ontological.[27] If we take χωριστός in a simple ontological sense,[28] Schwegler's conjecture about the text at 1026a14 would seem to be correct because the sensible things studied by physics are usually independent entities.[29] It is more likely, however, that Aristotle continued to

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mit Unbeweglichem zu thun, das jedoch nicht als Einzelwesen, als χωριστόν, sondern an der Materie existirt. Im Gegensatz gegen beide hat nun die Metaphysik Einzelwesen, und zwar unveränderliche und ewige zu ihrem Gegenstand, nämlich die Gottheit (woher ihr Name θεολογική)'; Schwegler, *Die Metaphysik des Aristoteles*, 4: 3.

[26] Perhaps it is significant that Aristotle is careful to distinguish between the mode of being of objects for the different mathematical sciences, especially since he asserts elsewhere in the *Metaphysics* (1073b3–8) that astronomy deals with sensible but eternal substances, whereas arithmetic and geometry do not deal with any substances. Thus, contrary to my logical interpretation, his carefully qualified remarks seem to involve an ontological meaning for χωριστός, especially in the case of heavenly bodies and their prime movers. I hold, however, that the logical relationship which a given form has to matter is what determines the ontological status of the (formal) object of the relevant science. For instance, the heavenly bodies may be the material objects of all three theoretical sciences; that is, of physics insofar as they move in perfect circles because of aether, of mathematics insofar as they embody geometrical forms, and of philosophy insofar as they are eternal substances.

[27] For instance, Happ (1971: 566) accepts Merlan's treatment of this passage as definitive, even though it assumes that Aristotle shifted his viewpoint without notice from *ratione essendi* (τῷ εἶναι) for physics and metaphysics to *ratione cognoscendi* (τῷ λόγῳ) for mathematics.

[28] At *Met.* VIII, 1, 1042a28–31, Aristotle distinguishes χωριστόν ἁπλῶς as the mode of being of a sensible composite from λόγῳ χωριστόν, which is the mode of being of the form; that is, the substance according to definition. Given the absence of this distinction from 6, 1, one might assume, as does Fine (1984: 42–43), that in its unqualified use χωριστός always has an ontological sense (*Met.* XIII, 10, 1086b14–20). The most appropriate sense for a discussion of the objects of theoretical sciences is logical separability, since these objects are universal essences rather than individual composite things.

[29] This is how Chen reads the passage, but he avoids the problem by positing what he calls 'universal concretes' as the immediate objects of physics, citing *Met.* VII, 10–11 as his authority. See C.-H. Chen, 1964: 52. Chen may be on the right track in giving the latter reference, but his acceptance of Schwegler's emendation leads him to accuse Aristotle of a 'typical' Platonic duplication of reality.

[44] use the | word in the sense established by the previous discussion of physical essences which are inseparable from matter. This would also fit with its usage in reference to mathematical objects when Aristotle says that they are perhaps not separable but have a mode of being as in matter (1026a15).

If Aristotle is referring specifically to sensible matter, this remark about the mode of being of mathematical objects might mean that they are not independent of physical substances. Thus χωριστός would be used primarily in the ontological sense of independent existence and, for the sake of consistency, we should have to assume that it was used in that way about physical objects also. The change in meaning could have been introduced previously (1025a7) with reference to whether mathematical objects are really separate or are merely studied as separate. On this reading, therefore, first philosophy deals with objects which are ontologically separate and unchanging, whereas physics deals with changing objects that are also separate in the sense of being self-subsistent.[30] On the other hand, some of the mathematical sciences inquire about unchanging objects which are not separate in this sense but which are dependent upon physical things.

While an ontological interpretation can be rendered plausible in this way, it introduces two distinct principles of division by means of the separation and the change criteria.[31] It also has the unfortunate effect of dislocating the tripartition of theoretical sciences from its broader context in *Metaphysics* VI, 1, where Aristotle discusses how the mode of being of a definable essence is determined by its relationship to matter. If sensible matter involves a potency for physical change, | however, then perhaps we can [45] understand why completely unchanging things are described as being separable (from sensible matter). On the other hand, if intelligible matter does not have a capacity for any kind of temporal change, then mathematical objects may be described as unchangeable though perhaps not separable.[32]

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[30] This ontological sense of separation is more appropriate to a discussion of substance, though it is open to different interpretations, as the exchange between Fine and Morrison shows (483n15 above). At *Met.* 1086b14–20, for instance, Aristotle says that if one does not suppose substances to be separate in the way that particular things are separate, then one will have eliminated substance in his sense.

[31] Perhaps Aristotle intended to use these as two distinct criteria in such a way that they have four possible combinations, which also correspond to actual sciences: that is, theology = separable + unchangeable; some mathematical sciences = inseparable + unchangeable; physics = inseparable + changeable; and astronomy = separable + changeable. For these suggestions about Aristotle's putative procedure here, I am indebted to Markus Wörner.

[32] According to Aristotle the objects of physics are said to be less separable than

Let this be our guiding thread for an alternative interpretation of Aristotle's division of the sciences.

Immediately afterward in *Metaphysics* VI, 1, Aristotle asserts that while all causes are eternal, those connected with the appearances of the divine are especially so (1026a16–18). It is unclear what appearances he has in mind, though he may be referring to the visible heavenly bodies since these were traditionally worshipped as divinities.[33] Thus it is quite in keeping with traditional beliefs for Aristotle to give the name of theology to the science that studies the unmoved mover as a cause of motion for these heavenly bodies. In any event, he concludes that there are three theoretical philosophies, namely, mathematics, physics, and theology. Despite ambiguities in the Greek, it is reasonable to assume that Aristotle is talking about the heavenly bodies when he says that the divine (τὸ θεῖον) is present in things of such a nature if it is present anywhere (1026a20). This assumption is borne out by the subsequent claim that the most superior (τιμιωτάτη) science deals with the most honourable (τιμιώτατον) genus of things and that theology is more choiceworthy (αἱρετώτερα) than the other theoretical sciences (1026a21–23).[34] The language here implies some value hierarchy for these sciences, corresponding to some ontological ranking of their objects, though Aristotle does not offer any further clarification.[35]

[46] Furthermore, it is not immediately obvious what connection this has with the subsequent (1026a23–25) aporia about whether first philosophy is

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mathematical objects because they are subject to change, which presupposes place (*Phys*. 193b36). By contrast, mathematical objects are not in place, though they have position relative to us, (*Met*. 1092a17–20).

[33] Kirwan thinks that this passage refers to the heavenly bodies, as in *Phys*. II, 4, 196a33–34, which are caused to move eternally and invariably by the spheres. See Kirwan, *Aristotle's Metaphysics*, 187; cf. *Met*. 1072a19, 1073b3. Kirwan fails to note, however, that this reference to objects of astronomy poses a problem for his account of the tripartition of theoretical sciences according to the ontological status of their objects.

[34] There are striking parallels with some fragments from the *Protrepticus*, Fr. 11 Ross, that talk about the theoretical sciences as the highest activity of man, whose ultimate happiness consists in the contemplation of the heavens, according to both Pythagoras and Anaxagoras.

[35] Perhaps the point can be clarified somewhat by reference to *Nicomachean Ethics* VI, 7, 1141a9, where Aristotle describes wisdom as most precise (ἀκριβεστάτη), since it combines intelligence (νοῦς) and scientific knowledge (ἐπιστήμη) in grasping the most exalted objects (τῶν τιμιωτάτων). Subsequently he rejects as absurd the view that either political science or prudence constitutes such superior knowledge, because mankind is not the highest thing (τὸ ἄριστον) in the universe. The string of superlatives in this passage also suggests that the value of a science for Aristotle is directly correlated with the ranking of its objects in some cosmological hierarchy. Thus, for instance, theology would be the highest science because the divine is prior to everything. See also *Topics* VIII, 1, 157a9–10; *Protrepticus* Frs. 6, 7 Ross, where knowledge of the most honourable things is called wisdom.

general (καθόλου) or whether it is about some particular genus or about a single nature. The question is legitimated by a parallel distinction within the mathematical sciences between particular sciences like geometry and astronomy, which deal with particular kinds of objects, and universal mathematics, which treats of all kinds of quantity. Aristotle's answer is not straightforward, however, since it takes the form of a double conditional: If there are no other substances besides those constituted by nature, then physics will be the first science, while if there is some unchangeable substance, then knowledge about it will yield first philosophy, and such a science will be universal precisely because it is first (1026a27–31).[36] Aristotle describes the subject-matter of such a universal science in terms of being qua being, i.e. both what it is (τί ἐστι) and the attributes that belong to it qua being. Along with the traditional problem of whether this is general or special metaphysics, I must address the question about how the mode of being of such essences (namely, their relationship to matter) can ground the division between theology and astronomy (which also seems to be dealing with divine entities).[37] Let us begin with mathematical and physical essences.

II [47]

To show how the mode of being of mathematical objects dictates the way in which they are defined, we must clarify their relationship to intelligible matter. This will require a brief survey of those passages where Aristotle differentiates between physical and mathematical objects in terms of the distinction between the snub and the concave. The importance of this distinction as a guiding thread within the maze of Aristotle's thought is highlighted by a passage in *Metaphysics* XI, 7:

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[36] The primary kind of being (that is, God as separate and immovable) studied by theology is merely a final cause of motion and not a formal cause for other beings in the universe, so that the priority relation in question is not definitional but rather ontological. See John J. Cleary, 1988, ch. 5. Ultimately, for Aristotle the unity and universality of the science of theology depends on the fact that being is a πρὸς ἕν equivocal and that substance is its primary meaning; see Michael T. Ferejohn, 1980: 117–128.

[37] At *Met*. VIII, 4, 1044b2 Aristotle seems to touch on this problem when he distinguishes between the sorts of accounts of causes to be given for destructible as distinct from eternal sensible substances. In the case of the latter, he suggests that they may have either no matter or such matter as can be moved only with respect to place. Thus the objects of astronomy, as being related to a special kind of matter, can be distinguished from objects of theology, which are not related to any kind of matter. Elsewhere (*Phys*. II, 2) Aristotle describes astronomy as the most physical of the mathematical sciences.

> Now since each of the sciences must understand in some way the whatness and must use it as a principle, we must not forget how the physicist should define things and how he must accept the formula of the *substance* of a thing, whether as in the case of the snub or rather as in the case of the concave. For of these, the formula of the snub states also the matter of the thing, but that of the concave does not state the matter. For snubness comes to be in the nose, and therefore the formula of snubness is investigated so as to include the nose; for the snub is a concave nose. Accordingly, it is evident that the formula of flesh, too, and of the eye and of the other parts must always be stated so as to include the matter. (*Met*. 1064a19–28, trans. Apostle)

Aristotle begins with an assumption about science which is familiar from the *Posterior Analytics*, namely, that the whatness (τὸ τί ἐστιν) is a principle for each of the sciences. This corresponds to the what is-it (τί ἐστι) question which he considers to be fundamental for any demonstrative science.

According to that account of science, however, there is a prior question to be answered about the object of inquiry, namely, the if-it-is (εἰ ἔστι) question.[38] Unless Aristotle has dropped such a question, it is plausible to correlate
[48] it with the demand in the present passage | that the mode of being of the whatness be made clear in terms of its relationship to matter. The importance of answering this prior ontological question depends on his claim that it dictates the logical and epistemological procedure of any given science. For example, if the mode of being of snubness is such as to make it inseparable from a certain kind of matter, this fact must be reflected in the definition of the snub and also in the way that the mind grasps the concept.[39] Thus the definition states that the snub is a concave nose and such a formula not only states the essence but also implicitly reflects its mode of being as an enmattered form. By contrast, as Aristotle points out, the definition of concavity does not contain any reference to the kind of matter in which it is embodied. This should also tell us something about the mode of being

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[38] Robert Bolton argues that this question is connected with the so-called nominal definition which involves identifying some essential part of the definiendum like the genus; see Bolton 1976: 514–544. This is compatible with my thesis if we make an additional connection between genus and matter; see *Met*. VIII, 6.

[39] Since Aristotle consistently links induction with the provision of physical principles, whereas mathematical principles are made available through hypotheses, perhaps these two ways of grasping first principles are dictated by the modes of being of the respective essences. Cf. *EN* VI, 8, 1142a11–20. This might explain why Aristotle says that experience is necessary for grasping the principles of physics, whereas this is not so for mathematical principles. Deborah Modrak (1989: 121–139) claims that mathematical principles are grasped through abstraction (ἐξ ἀφαιρέσεως), by contrast with physical and metaphysical principles which are acquired through experience (ἐξ ἐμπειρίας), but she does not elaborate on this putative epistemological theory of abstraction, which is difficult to find in Aristotle.

of its whatness but, unfortunately, Aristotle does not discuss the issue in the present passage. Thus we have to reconstruct his account from parallel passages.[40]

The most extensive discussion of the distinction between the theoretical objects of mathematics and physics is to be found in *Phys*. II, 2, whose initial reference back to a previous discussion of different senses of nature should alert us to the guiding perspective for the whole discussion.[41] It is precisely because Aristotle assumes as already established that mathematics is not about some supersensible | substances but is rather about sensible [49] substances in some way that it becomes necessary to distinguish it carefully from physics. From a historical perspective, of course, his opposition to the Platonic subordination of physics to mathematics in the *Timaeus* should also be taken as a motivating factor.[42] Thus, while explaining the need to distinguish mathematics from physics, Aristotle says that physical bodies have surfaces, solids, lengths, and points, about all of which the mathematician inquires.[43] Since this explanation implies that mathematical objects are ontologically dependent on physical bodies, and since theoretical sciences are distinguished in terms of their objects of inquiry, there arises a problem about how physics is to be differentiated from mathematics.

The problem is more acute for astronomy because that science is mathematical in character, though it appears to be dealing with physical objects in the heavens. Perhaps this is why Aristotle raises the additional problem of whether astronomy is a distinct science or merely a part of physics.[44] In

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[40] A relevant discussion which cannot be dealt with here because of its complexity is that contained in *Met*. VII, 4–6, where Aristotle discusses the difficulties associated with defining things like the snub because they seem to involve the addition of something else; for example, snub nose = concave-nose nose.

[41] Since 'nature' has already been given two senses as form and matter, the attempt to distinguish physics from mathematics is perhaps guided by the assumption that mathematics is also about a kind of form that may bear some relationship to a corresponding type of matter.

[42] See *Phys*. II, 1, 193b2, where Aristotle says that natural forms are not separable (οὐ χωριστόν) except in respect of their account (κατὰ τὸν λόγον). Subsequently (193b35), he distinguishes between logical and ontological separation for natural forms, presumably because the Platonists failed to do so. The inseparability of natural forms (from sensible matter) is consistently connected with the fact that they are principles of motion and of rest, just as we would expect from the subject-matter of physics.

[43] *Phys*. 193b23–25: καὶ γὰρ ἐπίπεδα καὶ στερεὰ ἔχει τὰ φυσικὰ σώματα καὶ μήκη καὶ στιγμάς, περὶ ὧν σκοπεῖ ὁ μαθηματικός. Since Aristotle is here posing a problem, we may assume that he is talking about the material objects of mathematics which overlap with those of physics, especially in the case of astronomy because both study the *per se* attributes of heavenly bodies. His solution will be to propose a distinction between material and formal objects, the latter of which are marked by him with the 'qua' locution.

[44] Astronomy also poses a problem for Aristotle's division of the sciences based on the

fact, as Ross points out, this particular problem is made the focus for Aristotle's discussion of the general problem of distinguishing mathematics from physics, presumably because it is the most difficult version of it.[45] Thus he declares (193b26–28) that it would be absurd (ἄτοπον) to think that the physicist should know the whatness (τὸ τί ἐστιν) of the Sun or the Moon, while
[50] not | knowing which of their attributes belong to them *per se* (καθ' αὑτὰ).[46] To further complicate the problem, it would appear that those who inquire about nature are concerned with the shape (περὶ σχήματος) of the Moon and the Sun; for instance, they ask whether or not the earth and the universe have a spherical form (σφαιροειδής). If one is to judge by traditional natural philosophy, therefore, there seems to be no doubt that physics is somehow concerned with the geometrical attributes of natural bodies.[47] Furthermore, the practice of Greek astronomers shows that these mathematicians concern themselves with physical bodies in the heavens.[48] Such facts make it more difficult for Aristotle to draw his distinction.

It is within the context of this specific problem about how astronomy is to be distinguished from physics that Aristotle attempts to sketch his own solution as follows:

> Now the mathematician, too, is concerned with these, but not insofar as each is a limit of a physical body; nor does he investigate attributes qua existing in such

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ontological status of their objects because it is about substances that are moved, whereas the pure sciences of arithmetic and geometry are about nonsubstances that are unmoved. This problem shows up later in the *Didascalicus* of Albinus where he lists astronomy first (III, 4, 11) as part of physics and later (V, 41–47) as part of mathematics.

[45] See W.D. Ross 1936: 506.

[46] The reason is, as *An. Post.* I, 4 explains, that the *per se* attributes of something belong necessarily to its essence. Therefore, the definition that captures this essence serves as a first principle for demonstrating that such attributes belong to the subject in question.

[47] In *De Caelo* I–II Aristotle himself studies the heavenly bodies as a physicist by asking about their formal, material, and final causes, while he also considers their geometrical attributes.

[48] Geminus is reported by Simplicius (*In Phys.* 290–291) to have explained that the astronomer and physicist often set out to prove one and the same point (for example, that the earth is spherical) but that they proceed by different roads. While the physicist starts from substance, force, or final cause, the astronomer proves his propositions from the attributes of figures or magnitudes, or from quantity of motion or time proper to it. In this context, the hypothesis that the earth moves is mentioned by Geminus as a proposal of Aristarchus that was designed to save the irregularity of the sun's apparent motion. He excuses such a wild hypothesis on the grounds that it is not the business of the astronomer to know what kind of bodies are naturally at rest or in motion, since that is the task of the physicist. Having adopted such first principles from physics, however, the astronomer will try to save the phenomena by proving that the heavenly bodies move either in parallel or oblique circles.

> bodies. That is why he separates them, for in thought they are separable from motion; and it makes no difference, nor does any falsity occur in separating them (in thought). (*Phys*. II, 2, 193b31–35, trans. Apostle)

[51] Aristotle concedes (μέν) that the mathematician is concerned with | the same things[49] as the physicist, presumably because of the ontological dependence of mathematical objects on sensible things. Thus since physics and mathematics are both concerned with the same sensible substances, the difference between them must be found in their respective approaches. This is what Aristotle is trying to express by means of the 'qua' (ᾗ) locution when he says that the mathematician also deals with the shapes of heavenly bodies but not insofar as each is the limit of a physical body.[50] In other words, if that shape is spherical then it will be part of the business of the geometer to inquire about its attributes, though not insofar as that shape is determined by characteristics of the sensible matter involved.

Thus, as he says, the mathematician does not study the attributes of a shape inasmuch as these belong to such kinds of bodies (193b33). In Aristotle's terms, this means that the mathematician separates (χωρίζει) his objects of inquiry from physical bodies and their changeable qualities. Such a procedure is defended as not making any difference and as not generating any falsehood because mathematical objects are separable in thought (or by thought) from change (193b34: χωριστὰ γὰρ τῇ νοήσει κινήσεώς ἐστι).[51] Here | Aristotle claims [52] that the logical character of mathematical objects is such that they can

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[49] The referent of τούτων is difficult to discern, as it might be either the shapes of the heavenly bodies or these bodies themselves. I take it to be the latter, however, since I follow Happ (1971: 567) in assuming that Aristotle here distinguishes between the material and formal object of a science.

[50] *Phys*. 193b32: ἀλλ' οὐχ ᾗ φυσικοῦ σώματος πέρας ἔσχατον. Wieland (1962: 197–200) argues that Aristotle's discovery of the 'qua' structure enabled him to avoid the Platonic hypostatisation of the predicate, by treating it only as an aspect of some subject. According to Wieland, the Aristotelian view of mathematics is grounded in *qua* because it makes possible the distinction between things and logical constituents which are not spatial parts of things. By contrast, the physicist must deal with the spatial constituents of things, which are not separable from the whole and its particular place. I think that Wieland has not adequately explained why the snub and the concave are used to illustrate the difference between definitions in these sciences.

[51] Fine (1984: 42–43) concedes that in this passage χωριστά refers to what she calls 'definitional separation', but she argues that this cannot be the central meaning of separation for Aristotle because his use of the complement τῇ νοήσει shows that it is not its simple sense. I think one can accept the claim that separation *simpliciter* (ἁπλῶς) functions as a criterion for primary substance, while still insisting upon the importance of definitional separation for theoretical knowledge of these substances.

be conceptually separated from the kind of matter that underlies change, without introducing falsehood into the science or affecting its activity in any other way.[52]

This point is sharpened in his subsequent analysis of the error committed by those Platonists who posit separated Ideas. According to Aristotle, they are unaware (λανθάνουσι) that they are doing the same as mathematicians, although they are separating physical forms which are less separable entities than mathematical forms.[53] Given the leading role of the mathematical sciences in the Academy, this can hardly mean that the Platonists were unaware of following the example of mathematicians in separating the Forms as objects of inquiry, and so it must mean that they did not realise that physical forms are not as separable from sensible matter as are mathematical forms. This is the logical fact which Aristotle emphasises when he explains that physical forms are entities less separable than mathematical forms, while illustrating his point in terms of the distinction between the concave and the snub.[54] When one tries to define such characteristic mathematical objects as number, line, and figure, along with their *per se* attributes (that is, odd and even, straight and curved), then it becomes clear that their definitions contain no reference to change (194a3–5: ἄνευ κινήσεως).[55]

[53] By contrast, as in the case of snubness, physical forms have definitions which involve an implicit reference to change in their material aspect. For instance, man may be defined as a rational mortal animal, while animal may be described as a sensible ensouled substance capable of locomotion.[56]

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[52] *Pace* Ross, I find no basis in the passage for attributing to Aristotle an epistemological theory of abstraction, though a logical method of subtraction may be involved in the separation of the formal object of a science. See Ross, *Aristotle's Physics*, 506–507; John J. Cleary, 'On the Terminology of "Abstraction" in Aristotle' (301–332 above). Merlan's differentiation (1954: 66–67) between abstraction as impoverishing reality and subtraction as enriching the reality of beings may be a helpful distinction here.

[53] *Phys*. 193b36–194a1: τὰ γὰρ φυσικὰ χωρίζουσιν ἧττον ὄντα χωριστὰ μαθηματικῶν.

[54] Heidegger in his *Sophist* commentary (1992: 100–103) takes the separation of mathematical objects to be from place and hence from motion, since place is a necessary condition of motion. Without an account of logical subtraction, however, he cannot adequately explain how the mathematician can separate the limits of physical bodies and consider them in themselves apart from place, without introducing any falsehood.

[55] In *Met*. XI, 3, 1061a28, Aristotle says that the mathematician conducts his inquiry about abstractions (τὰ ἐξ ἀφαιρέσεως), since he subtracts all sensible opposites like weight and lightness which are associated with motion and change, and is left only with quantity and continuity in one other dimension. He can therefore eliminate change from his subject-matter and study the attributes that belong to body qua continuous, though that does not eliminate intelligible matter, i.e. a three-dimensional continuum analogous to Plato's Indefinite Dyad.

[56] Simplicius, *In Phys*. 294.18–19: τὸ γὰρ ζῷον οὐσία ἐστὶν ἔμψυχος αἰσθητικὴ καὶ κατὰ τόπον κινητική.

Each of these defining descriptions includes a reference to the possibility of change, which Aristotle regards as a characteristic feature of all definition in physics. He therefore accuses the Platonists of failing to notice this logical fact, presumably because he thinks they were too enamoured of the mathematical approach to cosmology. Ross thinks that this departs from Aristotle's usual charge against the Platonists, namely, that they assign separate existence to the Forms.[57] Perhaps we should reconsider what separate existence means for Aristotle, given that he distinguishes between physical and mathematical forms in terms of their greater or lesser dependence on sensible matter. We should take into account the fact that, even in those passages where the question about separated forms is clearly ontological in character, it is consistently formulated as an issue about whether or not they are separated from sensible substances. At the end of *Phys*. II, 2, for instance, where the context is clearly logical, Aristotle insists that it is the task of first philosophy to inquire about the mode of being of a separated form and about what it is.[58]

Before leaving the *Physics*, however, let us examine a passage which poses [54] in its most difficult form the problem of distinguishing between the subject genera of physics and of mathematics:

> This is also clear in those parts of mathematics which are more physical, such as optics and harmonics and astronomy, for these are related to geometry in a somewhat converse manner. On the one hand, geometry is concerned with physical lines but not qua physical; on the other, optics is concerned with mathematical lines not qua mathematical but qua physical.
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> (*Phys*. 194a7–12, trans. Apostle)

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[57] See Ross, *Aristotle's Physics*, 507. Merlan (1954: 67) resists the suggestion that Aristotle is talking about a method of abstraction in physics here, since he opposes the whole doctrine of degrees of abstraction as un-Aristotelian and even as non-Thomistic. Rather, he thinks, the context proves that Aristotle is charging the Platonists with using language which implies that Forms of sensible things exist separately, whereas in reality they cannot. This reading, however, takes no account of the claim that physical forms are less separable than mathematical forms. I think this claim can only be understood in terms of the forms' different relationships to sensible matter.

[58] *Phys*. 194b14–15: πῶς δ' ἔχει τὸ χωριστὸν καὶ τί ἐστι, φιλοσοφίας ἔργον διορίσαι τῆς πρώτης. It is important to note that the leading question here (194b9) is posed as follows: Up to what point (μέχρι πόσου) should the physicist pursue knowledge of the form (τὸ εἶδος) and the what-is (τὸ τί ἐστιν)? Drawing a parallel with productive arts like medicine and sculpture, Aristotle suggests that physics should confine its attention to things which are separable in form (χωριστὰ εἴδει) but have their mode of being in matter (ἐν ὕλῃ). Charlton (1970: 97) takes Aristotle to be saying that the student of nature should consider the form of a thing only from the point of view of its natural function and how its material parts contribute to that end. By contrast, the first philosopher can consider the same form from the point of view of its mode of being, i.e. whether it is separate from matter or not. In this comment Charlton seems to have anticipated my interpretation, though he does not develop it along the same lines.

From the general context it would appear that Aristotle is still attempting to clarify the distinction between mathematics and physics, even though this particular passage only mentions sciences that are traditionally regarded as mathematical. When he refers to optics, harmonics, and astronomy as being more physical than other disciplines, this might mean that Aristotle is redrawing the traditional boundaries. Ross takes this passage to imply that these sciences are really part of physics rather than being especially physical branches of mathematics, since they are described as being 'the more physical of the mathematical sciences' (τὰ φυσικώτερα τῶν μαθημάτων).[59]

If we take this description seriously, however, its implications are important for his view about the relationship between mathematics and the physical world. This view emerges more clearly in his explanation of the inverse manner in which geometry is related to one of the more physical sciences like optics (194a9–12). Whereas geometry inquires about a physical line, though not qua physical, optics deals with a mathematical line, though not qua mathematical but rather qua physical. The forced appositional style of this passage shows that Aristotle is striving to make the same distinction within the mathematical sciences themselves as he had previously made between mathematics and physics. The motivation for his effort seems to be
[55] the | ontological claim that all of these sciences deal with the same sensible substances, but that each does so under different aspects. While geometry considers a line, but not as the boundary of a physical body, optics also inquires about a mathematical line but only insofar as that belongs *per se* to a ray of light.[60] Contrary to the received wisdom about Aristotle, this means that for him mathematical sciences can be applied concretely to the sensible world, although their application is rather limited.[61]

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[59] Ross, *Aristotle's Physics*, 506.

[60] At *An. Post.* I, 13, 79a6–10 geometry and optics are used to illustrate the relationship between sciences which know the reason why (τὸ διότι) and the fact (τὸ ὅτι), respectively. In that context mathematics is said to be only about forms (εἴδη), since its theoretical objects are not predicated of an underlying subject as such, even if they should happen to be in a subject. Here the 'qua' locution is used to indicate that geometry does not study forms insofar as they are in a substratum, even if they should happen to be in it. By contrast, optics studies the same forms insofar as they are in a material subject like air or water. This is what makes the so-called mixed sciences similar to physics, though they are not physical sciences because (unlike snubness) the forms they study are separable in definition from their material substratum.

[61] Proclus *In Eucl.* 40, 9 gives a more physicalistic account of optics when he says that it uses visual lines and angles made from them. Since he calls optics an 'offshoot' (ἔκγονος) of geometry, however, this means that it studies sensibly enmattered (ἔνυλα) forms which have emanated from the purer ontological realm of mathematics. I think it is clear that Aristotle

III

My guiding thread now leads me into the maze of *Metaphysics* VII, 10–12, where Aristotle's convoluted discussion of essence and definition traces the differences between the modes of being of physical and mathematical essences. Since he described a physical definition as making some reference to matter, it is reasonable for him to ask whether matter is part of the essence of a physical thing, as he does in VII, 10. His reason for raising such a general problem is the following:

> Since a definition is a formula, and every formula has parts, and since a formula is related to the thing in a similar way as a part of the formula to the corresponding part of the thing, we may now raise the question | whether [56]
> the formulae of the parts should be present in the formula of the whole or not. For they appear to be present in some cases, but not in others. The formula of a circle does not have the formula of the segments of the circle, but the formula of a syllable does have the formula of its letters; yet the circle is divisible into segments just as the syllable into its letters. (*Met*. 1034b20–28, trans. Apostle)

As Ross indicates (1924, II: 196), the *De Interpretatione* account of definition as consisting of a genus and at least one differentia serves as the basis for Aristotle's assertion that every definition (ὁρισμὸς) is a formula or account (λόγος) with parts (μέρη). But it is less easy to establish the grounds for his subsequent claim that there is a similar relation between the whole definition and the thing (τὸ πρᾶγμα) as there is between part of the definition and the corresponding part of the thing. Apostle (1979: 344–345) regards the claim as being 'somewhat dialectical', in view of the aporia about whether or not the account of the parts should be present in (ἐνυπάρχειν) the account of the whole. Such an impasse arises from the different dispositions of parts and whole both in different things and their definitions. On the one hand, the definition of a circle does not mention its segments (τὰ τμήματα) whereas, on the other hand, the definition of a syllable does specify its letters (τὰ στοιχεῖα). Yet it would seem that the circle is divided (διαιρεῖται) into segments in the same way as the syllable into letters. So the puzzle is how to explain the difference between these definitions.

By using *Metaphysics* V, 25 as background for the puzzles in VII, 10, one can clarify what Aristotle means when he says that in one way (ἔστι μὲν ὡς) matter is called a part, if there is a composite of matter and form; although,

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would accept neither such an ontological account nor the later Cartesian claim that geometry deals with the essence of physical substances. On the Aristotelian tradition of the so-called mixed sciences see James Lennox 1986: 29–51.

in another way (ἔστι δ' ὡς), matter is not called a part since it is not one of the elements out of which is constructed the account of the form (1035a1–4). For example, as Aristotle explains, flesh is not a part (in this sense) of the formula of concavity because it is only the matter on which the form supervenes (1035a4–5, a12: ἐφ' ἧς [ἐπι]γίγνεται). On the other hand, flesh is a part of the formula of snubness because, as he has explained elsewhere, snubness is concavity in a nose (1030b31–32). Another Aristotelian way of making this contrast is to say that, whereas the form of snubness can be embodied only in the material constituents of a nose, this is not the case
[57] for concavity which may be embodied in many different sorts of | matter. In conformity with his own theory of definition, however, Aristotle insists that what ought to be stated (λεκτέον) is the form of each thing insofar as it has that form, while the material element (τό ὑλικὸν) should never be spoken about by itself (καθ' αὑτὸ).[62] This logical theory enables him to resolve the initial impasse by explaining why the definition of a circle contains no reference to its segments, whereas the definition of a syllable does contain an account of its letters (στοιχεῖα: 1035a9).[63]

Aristotle's solution is to claim that the letters are parts of the definition of the form and therefore are not parts of the matter, whereas the segments are parts of the circle in the sense that they are the matter in which the form comes to be embodied (1035a11–12). Yet he also claims at 1035a13–14 that the segments as matter are closer to the form (ἐγγυτέρω τοῦ εἴδους) than bronze when it takes on the form of roundness (ἡ στρογγυλότης). The latter claim looks like an attempt to give some kind of ordering to the different sorts of matter, based on their proximity to the form. A similar attempt is to be found at *Met*. XIII, 8, 1084b12–13, where Aristotle says that the composite is nearer to the form (ἐγγύτερον τοῦ εἴδους) and to the object of definition, even though it is posterior in generation (γενέσει ὕστερον). In both cases it is clear that the form functions as an ordering principle, but in VII, 10 it is more clearly applied to the differentiation of kinds of matter. For instance, at 1035a14–17 he differentiates between those letters which are parts of the account of a syllable and those letters in wax or in air, which are parts only as sensible matter (ὡς ὕλη αἰσθητή).

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[62] See *Met*. 1035a8, 1036a8, 1039b27–30; *Rhet*. 1356b31; *De Gen. et Cor*. 332a25.

[63] The choice of syllable as an example of something whose form contains its elements can hardly be accidental, in view of one ordinary meaning of στοιχεῖον as a simple element of language. Frede and Patzig (1988, II: 169) also attach significance to Aristotle's choice of example here.

I think it is clear from the immediate context that by sensible matter Aristotle means the sorts of matter which embody forms that are accessible to the senses, for example, letters formed in wax so that they can be seen or touched, and letters spoken or propagated through the air (see *De Sensu* 446b6). These kinds of letters are not parts of the essential nature of the syllable which is captured in a definition, even though the sensible syllable would not exist without some | physical embodiment. Similarly, as Aristotle [58]
points out at 1035a17–20, even if a man disintegrates into bones, muscle, and flesh upon his destruction, this does not imply that these are parts of his essence (ὡς ὄντων τῆς οὐσίας μερῶν) but only of his matter (ὡς ἐξ ὕλης). The fact that he applies the same distinction to the relationship between a line and the parts (or halves) into which it is destroyed (φθείρεται) when it is divided (διαιρουμένη) means that Aristotle thinks of a mathematical form (for instance, line) as having to some kind of matter a relationship analogous to that which a physical form (for instance, man) has to an appropriate sort of matter (1035a7–9). Thus, as he explains, in both cases the material parts are parts of the composite (τοῦ συνόλου μέρη) but not of the form (τοῦ εἴδους) or of what is expressed by the definition. Therefore the material aspects of such things are not present in the definitions of their essential forms.

Aristotle concedes, however, that the account of a composite thing may refer to its material aspect when the thing is compounded from matter and form (1035a22). This seems to introduce a further twist to the initial aporia about whether an account of the parts should be present in an account of the whole. The answer, as we might expect, is that it depends on what kind of whole we have in mind. Some wholes, like the snub nose and the bronze circle, are compounded (συνειλημμένα) from matter and form, as the elements or principles into which they can also dissolved (1035a24–27). This is the reason why matter is included in any account of the kind of whole which Aristotle usually calls the composite (τὸ σύνολον). This term covers not only sensible individuals but also universal composites which involve sensible or intelligible matter.[64] In contrast to the composite whole, Aristotle claims that there are also wholes without matter whose definitions are of the form alone (1035a28). Such wholes are not destroyed at all or at least not by dissolution into their elements, since they are not compounds. When spoken

[64] Ross claims that the term σύνολον is applied (1) to the intelligible individual, (2) to the universal answering to a set of sensible individuals (1035b29), and (3) to the sensible individual. See Ross 1924, II: 197. Frede and Patzig (1998, II: 177) however, dispute the second claim on the grounds that Aristotle speaks about σύνολόν τι at 1035b29 and not about σύνολον simply, which is reserved for the sensible individual.

of simply (ἁπλῶς λεγόμενος) the circle seems to be a whole of this kind, since Aristotle claims that only the particular circle (ὁ καθ' ἕκαστον) is a | composite [59] with matter such as to make it divisible into segments (1035a33–b3). Hence no reference to its segments is contained in the definition of a circle.

From his discussion in *Metaphysics* VII, 10, however, it would appear that Aristotle thinks of particular circles as composites of form and matter analogous to concrete compounds in the sensible world. In the case of a bronze circle, for instance, it is plausible enough to think of the form of circularity being embodied in a certain kind of sensible matter, though it is not at all obvious what Aristotle means later at 1036a2 by talking as if the form of circularity were also embodied in intelligible matter. It is possible that he is talking about some principle of individuation for particular circles, since he later treats circle and soul as being analogous pure forms.[65] Thus he would seem to be treating the particular circle as an intelligible individual which involves the form of circularity in two-dimensional magnitude. Such entities, however, resemble the so-called Intermediates (τὰ μεταξύ) of the Platonists, whose existence Aristotle consistently denies.[66] Therefore, although he rejects the possibility of there being such substances either apart from or in sensible things, still he must clarify the precise mode of being of intelligible entities like the particular circles which he admits as being necessary for the science of geometry.

Given these distinctions between different kinds of parts, let us follow Aristotle's differentiation of the corresponding wholes (1035b27), beginning with the concrete individual which was called the primary substance in the *Categories* and which is composed of this particular form (τουδὶ τοῦ λόγου) and of some ultimate portion of matter (τῆς ἐσχάτης ὕλης). He claims that just as there are sensible composites like this man and that bronze circle, there are intelligible composites like the mathematical circles which are studied by geometry (1036a1). He also holds that there is no definition [60] of such | particular things, however, so that they are known only by being thought or sensed (1036a5–6: μετὰ νοήσεως ἢ αἰσθήσεως γνωρίζονται). As a result, their ontological status seems to be one of dependence because when the activity of thinking or sensing ceases it is unclear whether they exist or

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[65] In a problematic passage at *De An.* I, 1, 403a10–16, Aristotle discusses the possibility of soul being completely separated from matter, using the mathematical example of a straight line touching a bronze sphere at a point. R. McKay (1979: 86–91) takes this to mean that the οὐσία of soul will be no more separable from its appropriate matter than a geometrical line is separable from its matter, namely, such-and-such magnitude.

[66] See *Met.* 991b29, 997b14, 1059b6, 1077a1, 1090b36.

not.[67] If one takes existence in any modern sense, one might conclude that for Aristotle the existence of individual things (whether sensible or intelligible) depends upon our sensing or thinking. His point seems to be rather that individual things are always spoken about and known through a universal definition (ἀεὶ λέγονται καὶ γνωρίζονται τῷ καθόλου λόγῳ), and so the question of whether any particular entity falls under that definition is a matter for thinking and perceiving.[68] Even the primary substance of the *Categories* must be identified through a universal or secondary substance. In *Metaphysics* VII, however, Aristotle's inquiry into substance appears to be dominated by the question of definition, which naturally focuses upon the so-called secondary substances. While the substantiality of the individual man or horse is not denied, it is secondary from the point of view of analysis precisely because it is a composite of matter and form (*Met*. 1029a26).

In *Metaphysics* VII, 11 we find a discussion of the general problem about the parts of definition and their correspondence with the parts of the definienda. Having dealt with the leading aporia of VII, 10, Aristotle now introduces a related aporia (1036a26) about which sort of parts are parts of the form and which are parts of the composite (τοῦ συνειλημμένου). He explains that, unless this distinction can be made, each thing cannot be defined because the definition is of the universal or of the form (1036a28–29).[69] Thus, if one does not differentiate clearly between material and formal parts, the definition of each thing will not be clear. In the case of forms like circularity, which can be embodied in different kinds of matter, it is obvious that bronze, stone, or wood are not parts of the essence of the circle (τῆς τοῦ κύκλου οὐσίας) because the form can be separated (χωρίζεσθαι) from them.[70]

Yet, he concedes (1036b2–3), even in the case of forms which are not seen [61]
to be separated (χωριζόμενα) from a particular kind of matter, such a material part may still not be part of the form though it is difficult to subtract it in thought (ἀφελεῖν … τῇ διανοίᾳ). For example, the form of man appears to be always in flesh and bones and other such material parts, though we should ask whether (ἆρ᾽ οὖν) they are parts of the form and of the definition or whether

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[67] *Met*. 1036a6–7: ἀπελθόντες δὲ ἐκ τῆς ἐντελεχείας οὐ δῆλον πότερον εἰσὶν ἢ οὐκ εἰσίν.

[68] This interpretation fits better with the roles of ἔκθεσις and ἐπαγωγὴ in mathematics; see *EN* VI, 8, 1142a26–30 for remarks about the perception (αἴσθησις) of ultimate figures in mathematics.

[69] It is unclear here whether the καὶ is epexegetic or disjunctive.

[70] It would appear from the context that χωρίζειν here has a logical sense primarily, though it has implications for the mode of being of the essence being defined. *Pace* Fine, this passage contains an unqualified use of χωρίζειν that clearly applies to the separation of form from matter.

they are not (ἢ οὔ) but merely matter.[71] The second part of the question rests on a comparison with the circle because, as Aristotle explains, we might simply be unable to separate (ἀδυνάτου μεν χωρίσαι) the form of man from a particular kind of matter since we have not seen it embodied in any other kind (1036b6–7). Thus, as he already pointed out, nothing prevents the form of man from being like the form of circle, if we imagine a state of affairs in which all circles that we have ever seen were made of bronze (1036a35–b1). From Aristotle's formulation of this aporia it would appear that neither our sense experience nor our thinking determines the logical (or ontological) relation between form and matter, as represented in the definition of physical and mathematical things.

By way of compounding the aporia, Aristotle reports a difficulty raised by previous thinkers who noted the similarity between mathematical and physical composites (1036b7). They insisted that, since the relationship between the form of a circle and continuity is similar to that between the form of man and flesh, it is not correct to define a circle by means of lines and continuity.[72] Therefore they reduced (ἀνάγουσι) all things to numbers and claimed that the definition of line is the same as the definition of two. Judging by extant reports, this was a typically Pythagorean move, yet it is noteworthy that Aristotle represents it as being defended through an explicit parallel between mathematical and physical forms. According to other reports, the Pythagoreans treated the point as being analogous to the unit and the number
[62] two as being analogous to the line.[73] In fact, the tradition | of representing the three dimensions in terms of the numbers two, three, and four can be traced back at least as far as Philolaus. Here in *Metaphysics* VII, 11 the crucial point for Aristotle's discussion is that certain Pythagoreans did not regard continuous quantity as being part of the essence of the line, which they defined simply in terms of the number two. According to Aristotle's subsequent report (1036b14) these Pythagoreans included some Platonists who formulated their view in terms of the identity of the Dyad with the Line Itself (αὐτογραμμή).

By contrast, there were other Platonists who, while they accepted that Two is the form of the line (τὸ εἶδος τῆς γραμμῆς), did not think that the form is the same as that of which it is the form, at least not in the case of the line; though perhaps it is so in the case of the number two. In other words, for

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[71] Apostle gives a misleading translation of this passage which seems to treat the second part of the question as if it were Aristotle's statement of his own position; see Apostle 1979: 125.

[72] *Met.* 1036b9–10: οὐ προσῆκον γραμμαῖς ὁρίζεσθαι καὶ τῷ συνεχεῖ.

[73] See Alexander, *In Met.* 512.20–513.3, and *Scholia on Euclid* 78.19 (Heiberg). On these reports see J.A. Philip 1963: 185–198.

them 'line' is ambiguous since it may be taken strictly in the sense of form and defined in terms of Twoness or it may be taken as a composite of matter and form, which itself may be described as something like twoness in length (*Metaphysics* VIII, 3, 1043a33–34: δυὰς ἐν μήκει). From Aristotle's report here in VII, 11 it seems unlikely that the second group of Platonists held continuous quantity to be an essential part of the definition of a line, although it would seem necessary for differentiating this manifestation of Twoness from that found in the number two itself. Aristotle claims that these thinkers hold the view that there is one form for many things whose form still appears to be different.[74] For example, two cows seem quite different from two abstract units or even more so from a line, yet their formal structure is the same.

Having outlined some of the opinions which gave rise to the aporia about definition, Aristotle seeks a solution by refuting most of these opinions. For instance, the attempt to reduce everything to numbers and thereby to eliminate matter (ἀφαιρεῖν τὴν ὕλην) is dogmatically dismissed at 1036b22–23 as 'useless labour' (περίεργον) because some things are essentially 'a this in a that' (τόδ' ἐν τῷδ') or 'these things being thus' (ὡδὶ ταδὶ ἔχοντα). What Aristotle seems to be insisting on here is that the definitions of physical things, at least, must refer to specific subjects with appropriate attributes. Contrary to what Socrates | the Younger used to maintain, he insists that the relation [63] between the form of man and specific matter like flesh and bones is not the same as that between the form of a circle and bronze, for instance. What is misleading about such a comparison, according to Aristotle, is that it leads one to assume that the man can exist without his parts just as the circle can be without bronze.[75] He proceeds to show the falsity of this comparison by clarifying the distinction between the case of the circle and that of the man (1036b28–29). While the circle is something intelligible as the distinction implies, the animal is something sensible (αἰσθητόν) and cannot be defined without reference to motion. Therefore, Aristotle concludes, the animal cannot exist without its parts existing in a certain manner (1036b30: πώς). By way of clarifying the mode of being of these parts, he explains at 1036b30–32

[74] *Met.* 1036b7–18: ἕν τε πολλῶν εἶδος εἶναι ὧν τὸ φαίνεται ἕτερον.

[75] While one might be tempted to identify Socrates the Younger as one of the Pythagoreanising Platonists mentioned previously in VII, 11, the London group objects that such an identification is not completely warranted by the text, since Aristotle does not say that the comparison was incorrect on its own terms but merely that it leads one away from the truth. See Myles Burnyeat 1979: 91–92. I think that this hair-splitting is excessively subtle even for Aristotle, since he clearly does think that the comparison made by Socrates the Younger is false.

that the hand is not part of the man in every way (πάντως) but only when it can perform its function (τὸ ἔργον ἀποτελεῖν) and is thus alive (ἔμψυχος). If it is not alive, however, and is therefore incapable of fulfilling its purpose, then it is not a part of the man, strictly speaking, just as the severed finger is a finger only in name.

While the argument does show why a living thing cannot be defined without some reference to motion, it is not immediately clear how this logical fact undermines the comparison of a man and his parts with a circle and its bronze parts. It seems that the distinction between sensible and intelligible things which is implicit in the argument does not refute Socrates the Younger's claim, since the bronze circle is actually a sensible thing. Perhaps the point is that a circle, unlike a man, need not be perceptible and hence there are fewer grounds in experience for making bronze part of the definition of a circle than for making flesh and bones parts of the definition of a man. Yet Aristotle has previously admitted that sense experience does not establish the necessary connection between man and his material parts which would be characteristic of a definitional link. Therefore the weight
[64] of his argument must rest on a necessary connection between man as | a living animal and his characteristic motion. It must be through such a logical connection that some material parts necessary for that motion are brought into the definition of man, as Aristotle points out at *Metaphysics* 1035b16–18. In the case of a circle, however, there is no similar logical connection with any characteristic motion because mathematical objects are not in motion *per se* but only accidentally. This fact is crucial for Aristotle's distinction between physical and mathematical forms and their relationship to matter.

Such a distinction seems to guide the subsequent discussion of why the formulae of parts of mathematical objects are not contained in the formula of the whole. The relevant passage reads as follows:

> As for the mathematical objects, why are the formulae of the parts not parts of the formulae of the wholes? For example, why are the formulae of the semicircles not parts of the formula of the circle? For these objects are not sensible. But does this make a difference? For even some non-sensible things can have matter; for there is some matter in every thing which is not just an essence and a form by itself but is a this. Accordingly, as we said before, the semicircles will not be parts of a circle universally taken, but they will be parts of the individual circles; for some matter is sensible and some is intelligible.
> (*Met*. VII, 11, 1036b32–1037a5, trans. Apostle)

Many commentators and editors have treated this section as misplaced because it seems to go more naturally with the discussion of the difference between the relation of the circle to its semicircles and that of the syllable

to its letters at *Metaphysics* 1034b24–1035a17.[76] I tend to agree with Ross, however, that this passage represents a continuation of Aristotle's argument against the view which compares a sensible thing like man and an intelligible thing like a circle with respect to definition. While the logical relationship between a man and flesh is not comparable with that between a circle and bronze, perhaps it would parallel the relationship between a circle and its semicircles.

Thus Aristotle addresses the question as to why the formulae of the semicircles are not parts of the formula of the circle, since one would expect them to be if the case were comparable to that of man and flesh. One possible explanation for the lack of parallelism between the cases is that the circle and its semicircles are not sensible | things. Yet Aristotle appears to [65]
undermine this explanation when he asks whether being sensible makes any difference (1036b35), since his point seems to be that it is insufficient simply to say that semicircles are not part of the definition of a circle because they are not sensible things. He insists that some nonsensible things can have matter whenever they are individual things rather than essences or forms by themselves (1037a1–2). Therefore, he explains (1037a2–4), the semicircles as intelligible matter will be part of the particular circles (τῶν καθ' ἕκαστον) rather than of the universal circle (κύκλου … τοῦ καθόλου). According to Aristotle, this is the basic reason why the formulae of the semicircles are not parts of the formula of the circle: the definition of the latter is of the universal rather than of the particular circle.

As one can see from a survey of the relevant passages, the distinction between sensible and intelligible matter is closely linked with the distinction between definitions in physics and mathematics, and so it must have a direct bearing on the mode of being of the essences being defined. This is confirmed at *Metaphysics* VII, 10, 1036a9–12, for instance, where sensible matter is said to be subject to change, whereas intelligible matter is said to be in sensible things, though not qua sensible (nor qua changeable). So mathematical essences are defined without reference to change, but not without reference to intelligible matter such as two-dimensional extension; for example, the circle is a plane figure. Hence both physics and mathematics deal with the kinds of form that exist only in compounds with a certain kind of matter, and this is reflected in their characteristic definitions, as we see at *Metaphysics* 1036b32–1037a5, 1045a33–b2. By contrast, those pure forms which can exist

[76] Alexander thinks it belongs in VII, 10 and Bonitz concurs. The London Group hedges its bets with the conjecture that the section was a parenthetical part of an original VII, 11 which was revised somewhat after the question was reworked in VII, 10. See Burnyeat 1979: 93.

without any kind of matter are studied by the quite different science of first philosophy, which has its own distinctive way of knowing and defining its objects of inquiry.

IV

One reason for the confusion about the subject-matter of Aristotle's metaphysics is the different ways in which he himself refers to the science, for instance, as theology, first philosophy, and the science of being qua being. Commentators have disagreed about whether these descriptions refer to the same science or to different sciences, that is, to general and special meta-
[66] physics. My suggestion here is that some | of this confusion has arisen from a failure to distinguish between the formal and material objects of a science. Thus, for instance, both physics and metaphysics concern themselves with sensible substances (as material objects), though they have different formal objects as determined by their relationship to matter. The difference in their modes of being is reflected in their definitions by whether or not there is an obligatory reference to matter. In the case of physics such a reference to sensible matter is obligatory, but it is not when one is defining the pure forms studied by metaphysics. In that case one is studying being qua being, or substance as the primary mode of being, or the divine as the first and purest kind of substance. My concluding task is to show that all these descriptions of the subject-matter of metaphysics are consistent and that they resolve the puzzles raised at the beginning of the paper.

In order to explain why Aristotle gives different names to his science of metaphysics, it is necessary to elucidate what is being referred to in the phrase 'being qua being' and then to clarify how a science with such an object can also be called theology and first philosophy. One of the most prevalent assumptions is that being qua being refers to some material object of the science, such as sensible or supersensible substances, but I think this assumption is mistaken. Let us suppose that the phrase refers to sensible substance: then it will be unclear how metaphysics is to be distinguished from physics, whose material object is also sensible substance. As I have suggested, the only plausible solution is to treat both sciences as sharing the same material object but as having different formal objects, which are distinguished by means of the 'qua' locution. So, for instance, physics studies sensible substances qua moving, whereas metaphysics studies them qua being. Another possible misunderstanding, promoted by Owens, is to identify being qua being too closely with substance. This will not do because the

science of being qua being must concern itself with all categories of being, and substance is only one category, even if it is the most important. As Kosman has pointed out, substance is not itself an entity but rather a mode of being that is *per se* and primary among the categories.[77] Therefore, one must understand how an inquiry | into substance, and especially into supersensible substance, [67] can be made central to the general science of being qua being.

The difficulty can also be formulated in terms of causes, namely, whether physics and metaphysics are concerned with the same type of causal explanations. If they inquire about the same causes (that is, formal, material, efficient, and final) then it is difficult to distinguish these two sciences. In fact, this may be the reason why Aristotle says that physics would be first philosophy if there were no supersensible substance. Does divine substance introduce a new type of cause or simply a new perspective? I suggest that the positing of this type of substance involves a new perspective on the physical world and its immanent final causality. The unmoved mover is a final cause which is completely identical with its formal cause, since it is completely unrelated to any material cause and so is not involved in any temporal process. It is a pure actuality without any tincture of potentiality. Since it is completely disembodied, it cannot act as an efficient cause on the physical universe, and so can only serve as a final cause for those animated heavenly bodies that worship it by imitating its perfection through their circular motion.

We can now resolve some of the difficulties that I raised at the beginning of the paper. Contrary to initial appearances, metaphysics is not a special science concerned with the principles of a particular kind of being, since it inquires about substance which is the cause and principle of all being and reality. This is consistent with taking pure substantial form as the object of theology, whose primary instance is the unmoved mover as separate and eternal. Theology also qualifies as ontology because the true nature of being qua being is revealed better by this kind of substance than by sensible substance, since the latter is always embodied in matter and so has a potentiality for change. This is the confused whole of which Aristotle speaks in *Physics* I, 1 and whose elements must always be analysed and conceptually separated for the sake of knowledge. Physical forms, however, can never be completely divorced from the confusing element of matter, which cannot be spoken about in itself but must somehow be implicit in physical definitions. By contrast, supersensible forms can be completely separated from matter and studied in themselves as completely actual and intelligible entities. While

[77] Aryeh Kosman 1988: 165–188.

physical substances are more familiar to us, supersensible substances are more intelligible in themselves. Given the etymological connection between σοφία and | φάος, it is no accident that intelligible and divine things are most [68]
pellucid *per se*, whereas the underlying darkness of the body makes sensible things shadowy and indistinct.[78] Therefore, the science of first philosophy presupposes the existence of supersensible substance (*De Caelo* III, 1, 298b2–24).

From this perspective we can now follow Aristotle's analysis of the errors of the Platonists, who posited the wrong kind of supersensible substances. Either they duplicated sensible things in the case of physical forms, or they confused conceptual abstraction with real separation in the case of mathematical forms. Even they themselves could have detected their error if they had properly understood the implications of their own principles, namely, the One and the Indefinite Dyad. According to Aristotle, the latter was a material principle which the Platonists posited as a principle of plurality in order to escape from the absolute monism of Parmenides (*Met*. XIV, 2). In the physical realm, this material principle brings with it the qualitative opposites that were used as principles of explanation by Presocratic natural philosophers. No physical substance can be eternal, because such a material principle involves a potentiality for change that must be realised at some time or other. While the Plato of the *Timaeus* might have little difficulty in accepting this implication, he would be confounded by Aristotle's inference from his use of the Indefinite Dyad as one principle of a mathematical compound, namely, that such a compound cannot be eternal since it contains some potentiality, even if only for being divided. Aristotle insists that no composite thing can be eternal if it contains matter—not even number—since whatever is to qualify as an eternal substance must be a pure actuality (1088b20–28). Besides, he objects, the Indefinite Dyad is not an appropriate cause of plurality in all of the categories of being, since it is a principle of number (1089a31). What is required is some material cause that is different for each category, though analogous to matter in the category of substance, since it cannot be separated from substance (1089b27–28).

Finally, we must dispel an apparent inconsistency between what Aristotle says in *Metaphysics* X and XIV about the mutual exclusivity of eternity and potentiality. For instance, he says that none of the things that are absolutely
[69] indestructible are in potency absolutely | (1050b16), though nothing prevents them from being in potency with respect to quality or place. Therefore, he

[78] See *De Philosophia*, Fr. 8.

insists, primary things are in actuality and not in potency because if they did not exist then nothing would exist (1050b18–19). On the other hand, heavenly bodies can still be eternal even though they are in circular motion, because circular motion does not require a capacity for opposites. It would seem that only the latter type of capacity involves destructibility, so that the heavenly bodies can be indestructible even while having the capacity for motion in a circle. By analogy, the more abstract mathematical objects can be eternal compounds with intelligible matter as the capacity for being divisible or countable. While such intelligible matter looks very much like Plato's Indefinite Dyad, Aristotle connects it with the material aspect of sensible substance, that is, its aspect as the extension or number of physical bodies. In this way he anchors mathematics in the physical world and draws a parallel with physics, whereas he maintains that first philosophy separates its object of inquiry from all kinds of matter when it studies substantial form as a pure actuality. In the case of sensible substance this involves a high degree of separation, but this is justified by the existence of the unmoved mover as a pure supersensible substance. Hence this science can be called theology or even the science of being qua being, since this is the primary and focal meaning of being.

Conclusion

If the argument of this paper is correct, we must rethink the implications of Aristotle's division of theoretical sciences in terms of the mode of being of their formal objects. According to him, physics deals with sensible substances which have in themselves a principle of motion and rest, and this means that it studies natural forms which have an integral relationship with appropriate kinds of sensible matter. In contradistinction, mathematics studies quantitative forms which are related to a kind of (intelligible) matter that does not involve change, even though these mathematical objects are not independent of sensible substances. Therefore, materially speaking, physics and mathematics study the same substances, even though they have formally different objects of inquiry. This distinction between material and formal objects of inquiry represents one of Aristotle's conceptual advances over the simple correspondence between | sciences and substantial objects [70] that prompted the Platonic tripartition of being into Forms, Intermediates, and sensible things. Since there is no need to posit separate Forms or Intermediates as objects of science, the only pressing ontological question for Aristotle is whether there exists any kind of supersensible substances

apart from the self-evident sensible substances. If there are no such separate substances then there will only be two theoretical sciences, since physics deals with sensible substances as natural forms that are inseparable from their appropriate sensible matter, and mathematics studies quantitative forms that are also inseparable from a kind of intelligible matter (namely, magnitude) associated with physical bodies. Thus the possibility of another theoretical science depends on whether there is any kind of pure form that can exist independently of both sensible and intelligible matter. If there are such forms, they will be defined differently from physical and mathematical forms, whose definitions contain some implicit reference to the corresponding matter in which they are embodied. Furthermore, these supersensible forms cannot be grasped through induction like physical and mathematical forms, since they are not accessible to sense perception. They can only become available through a special activity of the intellect, involving an immediate identity of the mind with its object, which Aristotle described as divine. In fact, this description indicates that he considered human beings to be capable of having a science of theology because they can share (even if only briefly) in the divine activity which involves a complete identity between thought and object. As he says at *Met*. I, 2, 983a4–11, this highest theoretical science is really for the gods because it involves knowledge of divine objects, and therefore it is most appropriate for beings whose eternal activity is reflection upon themselves. Such an activity can be engaged in by human beings only because part of their soul is separable from the body, as evidenced by the functioning of the intellect. In this respect, therefore, Aristotle accepts the Platonic belief (which became a maxim for the Stoics) that our greatest human potential is realised through imitation of the divine.

HISTORY OF PHILOSOPHY

C. *Proclus and Later*

In the third book of his *Commentary on Plato's Parmenides*, we find Proclus defending Platonic Ideas against the criticism that is implicit in Parmenides' questioning of the young Socrates. Naturally enough, Proclus interprets this criticism as maieutic[1] since he does not want to believe that Plato would put into the mouth of Parmenides such objections as would undermine his own doctrines. But, as I hope to show, it is Proclus rather than Plato who dogmatically defends the Theory of Ideas by situating it within the context of the whole Neoplatonic hierarchy of reality.[2] It is probable that Proclus had in mind Aristotle's criticisms of Platonic Ideas, and that he wanted to show that these were fundamentally mistaken.[3] In any case, I think it is clear that Proclus defends the existence of Ideas by drawing on Neoplatonic resources, which he regards as essential for solving the metaphysical problem originally raised by Plato.

In this short paper, however, I will confine myself to asking about the
[342] rationale for Proclus' philosophical[4] defence of Ideas | by expanding the reach of Platonic theory both at the higher and lower levels of reality. In other words, I want to consider whether there is a philosophical problem that is being addressed by Proclus or whether he is simply elaborating on his system for its own sake. If the latter were the case, then we might feel less sympathy for his project, which would look more like barren scholasticism than living philosophy. On the other hand, if we could identify a live philosophical problem with which Proclus was grappling, we might be more willing to

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[1] According to the middle-Platonic classification of Platonic dialogues, the maieutic and the peirastic are sub-divisions of gymnastic dialogues. Typically, in a maieutic dialogue, the conversation-partner is helped to make explicit some implicit ideas. However, middle-Platonists like Diogenes and Albinus classified the *Parmenides* dialogue as 'logical'; cf. DL 111.49 & Albinus, *Prologus* 111.148.19 ff., *Did*. 159.7–9.

[2] On the other hand, Proclus also opposes those interpreters who took the *Parmenides* to be a doctrinal dialogue 'On the Forms', by showing why it is necessary to go beyond the Forms to the highest principles of reality; cf. *In Parm*. 626.1–4, 636.21–22.

[3] I think this suggestion is confirmed by the *ad hominem* character of some of Proclus' arguments, where he tries to show that Aristotle's objections against Platonic Ideas are not well founded.

[4] Accepting Steel's distinction (1984) between epistemological and metaphysical arguments made by Proclus, I take the metaphysical arguments to be most important because they dictate his epistemological arguments, as is typical for most Greek thinkers.

see his arcane system as containing real solutions. In this latter vein, I want to suggest that Proclus is addressing in a new way the old problem of participation, by responding to the Aristotelian objection that the Ideas do not serve as efficient causes.[5]

I. *The Problematic of Plato's* Parmenides

At the beginning of Book 3 of his commentary, Proclus emphasises the maieutic function of Parmenides' questioning of the young Socrates.[6] According to Proclus, the purpose of this questioning is to establish whether Socrates remains on the lower level of opinion about Ideas or whether his intelligence rises to the higher level of the transcendent monads themselves. Assuming that the latter is the case, Proclus argues that it must be through questioning that the Socratic intellect is able to catch sight of the intelligibles. Here (*In Parm*. 784.1) Proclus | explicitly rejects Aristotle's reports (*Met*. 987b1–4, [343]
1078b27–30) that Socrates did not separate Ideas. Without providing any supporting historical evidence, however, Proclus insists that Socrates had grasped separate Ideas through his divine instinct because, as a young man, he was roused to see these Ideas by his own efforts. I think we can be reasonably certain that Proclus is not reporting on the historical Socrates but rather idealising the Socratic persona as presented in Plato's *Parmenides*.

Another possible motivation for his maieutic interpretation of the aporias about Ideas may be found in Proclus' report (*In Parm*. 971.29–32) on the typical Neoplatonic response to Aristotle's objections, namely, that these had already been anticipated and rejected by Plato. Thus for the Neoplatonists, the puzzles about Ideas can only have been intended by Plato to clarify the status and function of Ideas (cf. *In Parm*. 971.16–22, 951.33–36). For those Neoplatonists who tried to reconcile Plato and Aristotle, the objections to Ideas made by Aristotle must be seen to have the same maieutic function. Yet this can hardly be the interpretive strategy of Syrianus and Proclus, since both felt the need to defend Plato against Aristotle's objections.

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[5] As an illustration, perhaps one could point to *Met*. XIII, 5, 1079b13 ff. where Aristotle objects to separate Platonic Forms by asking: What do the Forms contribute to the eternal beings among the sensibles, or to those which are generated and destroyed? An implied negative answer to this rhetorical question is justified as follows: For they are not the causes of motion or of change in them.

[6] In *Platonic Theology* I.8, Proclus outlines two competing interpretations of the *Parmenides* as (a) logical gymnastics, (b) an inquiry into principles but not theology. By contrast, Proclus defends what he calls a 'real' interpretation of the dialogue as elucidating different classes of the divine.

In fact, Proclus outlines the four problems[7] he takes to be central to Plato's *Parmenides*: (1) Do Ideas exist? (2) Of what things are there Ideas? (3) What sort of realities are Ideas, and what is their peculiar property? (4) How do things in the world participate in them, and what is the manner of that participation? Given that the first problem is not addressed by Plato, Proclus finds it necessary to provide arguments to establish the hypothesis of Ideas. I think it is significant that Proclus mentions this lacuna several times, and also explicitly undertakes the task of filling it (cf. *In Parm*. 784.25–785.4, 838.10–12, 891.78). He gives a clear indication that this digression in the commentary reflects his own special interests, and he claims it as his own original contribution (cf. *In Parm*. 784.27–28, 805.1–2).

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II. *Neoplatonic Metaphysics*

However, the initial argument about the self-constitution of the cosmos only makes sense within a Neoplatonic schema, given that his intention is to establish the inferior position of the visible cosmos within that hierarchy, and thereby establish the necessity of higher explanatory principles such as Forms and Intellect.[8] The argument has the typical structure of a *reductio ad absurdum*: If this cosmos is self-constituted, many absurd results follow. For whatever is self-constituted must be without parts, since everything that creates and everything that generates is altogether incorporeal. Proclus claims that even bodies themselves produce their effects by means of incorporeal powers, e.g. fire produces heat (by hotness). Assuming that whatever creates must be incorporeal, and since in a self-constituted thing it is the same thing that creates and is created, then the self-constituted must be altogether without parts.[9] But the physical cosmos does not have such a character, since every body is divisible in every way; and so the cosmos is not self-constituted.

Proclus goes on to argue that the cosmos is not self-activating, in contrast to self-constituting things which are self-generating and so naturally able to act on themselves. In effect, the argument is that the cosmos is not self-moving, since it is corporeal. Thus the cosmos derives its being from some other cause which is higher. But this leads Proclus to raise a related question

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[7] Compare the slightly different list of questions about Ideas given by Syrianus, *In Met*. 108.31–109.4.

[8] Presumably, Proclus emphasises the primacy of this argument because it establishes the necessity of going beyond the physical cosmos to its intelligible principles.

[9] See *Elements of Theology* (ET) Props. 40–51 for propositions concerning self-constitution.

about whether this cause acts by rational choice, or whether it produces the universe by its very being. If it acts by deliberate choice, its action will be unstable and variable, so that the resulting cosmos would be perishable. Judging from Plato's account of the creative activity of the demiurge in the *Timaeus*, one might think that he accepted this implication about the
[345] perishability of the cosmos, even if it never actually | perishes (cf. esp. *Tim.* 41a–b). But Proclus claims that, since the cosmos is eternal in a way, what creates it must be so by its very being or essence (αὐτῷ τῷ εἶναι).[10] In fact, Proclus says (*In Parm.* 787.1), everything which acts by deliberate choice necessarily has some creative activity that it exercises by its very being, e.g. our soul does many things by choice but it gives life to the body by virtue of its very essence. In this argument he is appealing to a general principle of Procline metaphysics (*ET* 57), namely, if the power of creating by its very essence extends more widely than creating by deliberate choice, then it flows from some higher cause. Proclus explains that such creative activity is effortless, and is also characteristic of the divine.[11]

The crucial point of this argument with reference to Proclus' hierarchy is that since the cause of the whole cosmos creates by its very being, then this creator is primarily what its product is derivatively, and gives to it in a lesser degree the character that it has primarily, just as the soul both gives life and has life. Thus (*In Parm.* 788.1) the cause that creates the cosmos by its very being is primarily what the cosmos is derivatively. Given that the cosmos is a plenum of Forms of all sorts, it follows that these Forms will exist also primarily in the cause of the cosmos. For instance, Sun, Moon, Man, Horse, and generally all the Forms in the universe exist paradigmatically in the cause of the universe, namely, another Sun besides the one we see, another Man, and so on for all Forms. Consequently, the Forms that exist prior to sensible things as their demiurgic causes also pre-exist in the single cause of the entire cosmos. In effect, the Forms exist paradigmatically in the demiurgic Intellect, which is the 'place of the Forms' though in a different sense than Aristotle | had in mind. The divine Intellect produces everything [346]

[10] Cf. J. Trouillard 1958 for a classic elucidation of this Neoplatonic notion of causality.

[11] A corollary of *ET* 34 states that all things proceed from Intelligence (νοῦς) since it is an object of desire for all things. Thus, according to Proclus, it is from Intelligence that the whole world-order (κόσμος) is derived, even though the latter is sempiternal. Perhaps this represents an attempt to reconcile Plato's talk of the 'generation' of a cosmos in the *Timaeus* with the Academic tradition that the world-order is eternal. If the procession is logical rather than temporal, Intelligence can proceed eternally and be eternally reverted, while still remaining steadfast in its own place in the cosmos.

by thinking the Forms that are contained in it, since thinking is identical with being (*In Parm*. 794.28–795.8, 799.5–22). Thus Proclus goes much further than Plato or Aristotle in holding that the Ideas of everything pre-exist in the divine Intellect (*In Parm*. 790.5–10, 792.37–793.2).

In the light of this conclusion, Proclus now criticises Aristotle for letting the divine serve only as a final cause of the universe, though he concedes that Aristotle is right to make the good preside as cause over the cosmos. Yet, Proclus argues, Aristotle fails to say whether the cosmos receives anything from that good or receives nothing from it. If it gets nothing, its striving would be in vain.[12] But, if it receives something, that cause is surely and eminently the good which it bestows on the cosmos, especially if it does so by virtue of its essence. Thus Proclus concludes that the cause will not only be the final but also the efficient cause of the cosmos.[13] This was an inadequacy in Aristotle's concept of the prime mover which Proclus tries to exploit here in support of the Platonic tradition.[14]

As additional support, Proclus begins with the argument for the existence of Platonic Forms based on the existence of opposites in sensible things (cf. *Rep*. 523ff.) and then goes on to claim that the demiurge of the cosmos contemplates these Forms in his Intellect. By citing the Neoplatonic principle that the greater power is productive of more perfect effects, he postulates this demiurgic Intellect as the cause of order in the cosmos, while rejecting any account which leaves this ordering to chance
[347] or necessity.[15] Subsequently, in order to establish the | priority of Intellect over Nature, Proclus appeals to another Neoplatonic principle which gives priority to an ordering cause that knows itself over any cause that does not know itself. By contrast with Aristotle's prime mover, the demiurge is a providential cause because he also knows those things for which he is an object of desire. He is the unmoving cause of all things insofar as he determines their ordering by virtue of his very being or essence, i.e. not by rational choice but by virtue of his knowledge of himself.[16] In effect,

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[12] As Carlos Steel (1984: 20) points out, this first part of the argument trades on Aristotle's notion that natural desires are normally satisfied in the cosmos, otherwise they are in vain.

[13] Cf. *In Parm*. 842.26–35, *In Tim*. I.266.29–267.14.

[14] Elsewhere, *In Tim*. I.267.4, Proclus castigates Aristotle for departing from Platonic teaching on this point when he traces the so-called 'upward tension' towards the unmoved mover, without tracing any downward chain of causal dependence. Against Aristotle, Proclus argues that the conception of deity as the goal of desire is unintelligible when divorced from the corresponding conception of god as the source of being.

[15] Cf. *In Parm*. 790.5–791.28, 798.21–799.5.

[16] Cf. *In Parm*. 844.1–2, 791.21; *In Tim*. I.421.29–422.1.

Proclus insists that the demiurge is not only the final cause but also the efficient cause of the whole cosmos, and thereby resolves to his own satisfaction the difficulty already noted with reference to Aristotle's prime mover.[17]

III. *Intellect as Moving Cause*

Proclus seems to be deliberately echoing the Aristotelian objection against separate Platonic Forms when he considers how it happens that 'man generates man'.[18] Since the cosmos is ordered, he rules out the possibility that this generation happens by chance. Next (*In Parm*. 792.1) he considers the typical Aristotelian answer that an individual comes from the human seed, but rejects this as inadequate because seed possesses the human reason-principles only potentially. In this way a typically Neoplatonic view about the actuality of the reason-principle is smuggled in under the cover of the Aristotelian axiom that actuality is prior to potentiality. Proclus concludes that Nature has the reason-principle of man in actuality and that it is the cause of individual men. That conclusion is then used to justify the Platonic claim that the universal is prior to the particular, and | it is further supported [348]
by the Neoplatonic axiom which states that all things which are perfected through inferior powers are established more perfectly by more universal beings. This allows Proclus to infer that there must be some other cause prior to Nature that contains Ideas, given that Nature typically infuses herself into bodies and so belongs to other things and not to itself. Since Nature is non-rational (ἄλογος), it needs a rational cause to guide it (*In Parm*. 794.23–26). According to Proclus, Intellect is this rational cause which is higher than Nature, and which possesses the reason-principles in its own self-reflexive manner.

For my purposes, however, it is revealing to compare Proclus' account of the causative action of Intellect with Aristotle's account of the causation of the prime mover. By contrast with Aristotle, Proclus assumes that all things eternal in essence (like Forms) are produced by an unmoving cause. For

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[17] In his *Commentary on the Timaeus*, *In Tim*. II.122.13–16, Proclus cites a physical work of Theophrastus (*De Caelo*) which argues that the heavens must be ensouled and therefore divine. Even if this were not a correction of Aristotle by Theophrastus, it would represent at least a clarification of how the prime mover can act on the heavens, given that it is not an efficient cause; cf. Theophr., *Metaph*. 5b7–10.

[18] See *Met*. VII, 8, 1033b26, where Aristotle rejects the need for Platonic Ideas in explaining how man generates man.

instance, Man Himself and all other Forms must derive from an unmoving cause on which the whole cosmos depends. But this cause cannot be located primarily in Nature because the latter is nonrational. Therefore, the productive cause of the cosmos must be located primarily in Intellect, secondarily in Soul, thirdly in Nature and lastly in bodies. This neatly encapsulates the metaphysical hierarchy of Neoplatonism, which is foreign to the thinking of both Plato and Aristotle. Yet one might concede that Proclus is exploring a profound philosophical puzzle about the very existence of Forms, which may have been neglected even by Plato.

In a masterly dialectical stroke, Proclus invokes the Aristotelian theory of demonstration to show that it presupposes Platonic Forms, even though Aristotle had explicitly denied this (*An. Post.* I, 11, 77a5). The crucial point in the Procline argument is that demonstration depends on universals that correspond to more authoritative causes, i.e. Forms which are more substantial than particulars. In fact, one can find some basis for this argument in *Posterior Analytics* I, 24 where Aristotle says that the universal is better (βελτίων) than the particular because it reveals the cause. Using a slightly *ad* [349] *hominem* argument, Proclus claims that demonstration requires Ideas rather | than mere universals because the premises contain the causes that are prior by nature to the effects contained in the conclusions (cf. *In Parm.* 980.17–24, 789.6–14, 796.16–37, 894.29–35). In this light, Proclus rejects Aristotle's theory of abstraction on the grounds that universals produced by the mind are 'later-born' (ὑστερογενῆ) and so cannot provide foundations for knowledge of reality. These 'later-born' universals are sharply distinguished by Proclus from the *logoi* in the soul, which he calls Ideas (*In Parm.* 892.40–895.1). In support of his own view, Proclus rejects the Aristotelian interpretation of the historical Socrates by insisting that Socrates reached his conception of separate Forms through reversion to Intellect. This is obviously a Neoplatonic notion but, in support of it, Proclus draws on the Platonic portrait of Socrates in the *Phaedo* to claim that he was separating himself from his bodily nature. In this way, Proclus rather implausibly attributes to Socrates the Neoplatonic distinctions between the bodily substrate, the participated form, and the transcendent and imparticipable Form.

At *In Parm.* 790.2 ff. Proclus provides us with another argument for adopting the hypothesis of Ideas, namely, that all visible things, both heavenly and sublunary, exist either by chance or by a cause. But it is impossible for them to exist by chance because that would mean that superiors and inferiors will be mixed together, i.e. intellection, reason-principles, and cause will be classed with things derived from causes. But this would mean that products would be superior to principles, which is obviously absurd.

In support of his own argument, Proclus later (*In Parm.* 798–799) cites Aristotle's argument that essential causes must be prior to accidental causes, since the accidental cause is a by-product of essential causes. So what comes about causally would be prior to the accidental, even if the most divine parts of the visible were to have come about by accident (*In Parm.* 799.1 ff.). And if there are causes of all things, they will be either many and unconnected or one. But if they are many, we cannot say what makes the universe one; and yet the one is superior to the many, and the whole to the parts. But if there is one cause of order in the universe, it would be absurd if it were without reason, | since the rational is superior to the irrational. But if this cause has [350] reason and knows itself, it knows itself as the cause of all things; otherwise it would be ignorant of its own nature. Yet if it knows itself as the cause of the universe, it also knows its effects. So it is by knowing the immaterial reason-principles and forms in itself that it knows the reason-principles in the cosmos, and the Ideas of which the universe consists.

As independent confirmation for his defence of the hypothesis of Ideas, Proclus appeals (*In Parm.* 799–800) to 'theologians' like Plato, Pythagoras and Orpheus, who share a general consensus which is confirmed by the wise men in such matters. Proclus claims (801.27 ff.) that the gods have clearly said that they themselves are Ideas of the Father (being resident in His thoughts), that they go forth for the making of the cosmos (for the 'launching forth' is their procession), and that they have all sorts of forms that contain the causes of all particular things. Thus, according to Proclus, Plato's *Timaeus* places the single primary productive cause of all the Ideas among the Intelligibles (for that is the location of the Living Being Itself),[19] while the Oracles say that the source of the Ideas pre-exists in the demiurge.

Although these two different accounts appear to disagree with one another, Proclus tries (802–803) to reconcile them by arguing that it is not the same thing to seek the single universal cause of the cosmic ideas and to contemplate the primary manifestation of the whole series of them. Rather we should refer the content of the one class to the demiurge, and the content of the others to the intelligibles in the divine hierarchy, from which both the demiurge and all the orders of being are 'filled with' ideal substances. So the demiurge is form-giving in two ways, both by virtue of the source in himself and by virtue of the intelligible Ideas; for among the latter are the universal causes of all things, i.e. the four monads. From that intelligible realm they move downwards through all the divine orders to the last,

[19] *In Tim.* I, 418–430 & 324.9–22 shows this to be the doctrine of Syrianus.

so that even the lowest—the sensible images—have some likeness to them, in some cases relatively clear, in others obscure.

Thus Proclus claims (*In Parm.* 803.3 ff.) that anyone capable of following [351]
the divine processions can see, if one examines the perceptible forms of enmattered things, that every perceptible form has received properties from all the ranks of being. For instance, self-motion itself and eternity are present in sensible forms from no other source than the primary Ideas. These are what is eternal in the primary sense, and they pass on their properties to the things in the next and each succeeding rank. In general, Proclus holds (*In Parm.* 803–804) that, to the extent that a form strives to converge on itself as a unity, it reflects the likeness of the summit of the intellectual realm of undivided Forms. But as it goes forth in company with life and subsists within motion, being presented as a motionless image in moving things, then the more it participates in the chain of life-generation and expresses the powers of life-generating forms.

The general thrust of these arguments tends to support my claim that Proclus' own hierarchy of being determines his interpretation and appropriation of Platonic Ideas. For instance, at *In Parm.* 804–805, he concludes his detailed argumentation as follows: as we proceed downwards from the intelligible Ideas to the lowest orders of being, we shall observe the continuity of the whole series and can distinguish intelligently what peculiarities sensible things have drawn from each rank. He appeals to the following axiom: All secondary things must participate in the beings that precede them, and thus each of them, according to the rank assigned to it, enjoys each of its predecessors. This is in perfect accord with the divine processions themselves; for the sequence of the secondaries parallels the particular organisation in each of the divine series, whether intelligible, intellectual or supra-cosmic; and again whether functioning as cohesive, or generative, or creative, or as some other divine attribute.

Conclusion

From our modern perspective it might appear that Proclus is simply engaged in elaborating on the Neoplatonic hierarchy of being rather than in solving pressing philosophical problems. | In this paper however, I have tried to show [352]
that he does have a plausible rationale for defending Plato's hypothesis of Ideas against Aristotle's objections, since the prime mover is a final cause but not an efficient cause of things in the universe. Yet Proclus goes much further than either Plato and Aristotle in positing the existence of paradigmatic

Ideas in the divine intellect which is the productive cause of everything in the cosmos. As a result of such an Intellect thinking its own contents, the Ideas are produced and they also proceed to lower levels in the hierarchy of being, where they function as *spermatikoi logoi* in the Soul and in Nature, which ultimately produce the individual human beings and other animals.

Introduction

From our 'superior' modern perspective, on the one hand, it appears that Proclus carries far too much Neoplatonic doctrine into his interpretation of Plato's *Timaeus*, but, on the other hand, from an ancient perspective, he may be taken as accurately reflecting one tradition of interpretation whose legitimacy cannot be dismissed, since it can be traced back to the early Academy. Given our historical distance from Proclus, it is relatively easy to identify his interpretive presuppositions, though our own prejudices remain largely hidden from us. In this respect, Proclus might well serve as an object lesson with regard to the necessary hermeneutical situation of any reader of ancient texts, namely, that there is no such thing as an interpretation that is completely free of all presuppositions. So, as readers of Plato, we should strive to become aware of our own presuppositions as we are engaged in a dialogical conversation with the text.

In this paper, however, I will try to identify some of the hermeneutical assumptions that guided Proclus in his reading of Plato's *Timaeus*, while exploring how these assumptions are related to a central philosophical problem in the dialogue. For instance, in the third section of my paper, I will pay some attention to the traditional Platonic question of whether or not the sensible universe is generated, which is reformulated by Proclus in Neoplatonic terms as whether or not the universe is self-constituted. Even though such a question seems incidental to the dialogue itself, by highlighting the problem Proclus is obviously continuing an ancient way of reading Plato's *Timaeus* that had begun already within the early Academy with the dispute between Aristotle and Xenocrates as to whether Plato held the sensible universe to be eternal or rather temporally generated.[1]

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[1] See Aristotle, *De Caelo* 279b32 ff., Xenocrates, frs. 153–158 and 163 Isnardi, Speusippus, frs. 41 and 72 Tarán. Plutarch and Atticus seem to be in the minority among Platonists in claiming that Plato held the sensible universe to be temporally generated; cf. Proclus, *In Tim*. I.276.30 ff. According to Baltes (1976 I: 22), Xenocrates probably argued for the eternity of the sensible world from the eternality of the world-soul, while reinterpreting Plato's temporal talk as being for the sake of explanation; cf. *In Tim*. I.395.1–10.

In his attempt to interpret Plato's *Timaeus*, therefore, it was inevitable that Proclus should deal with the philosophical question of whether or not the sensible cosmos is generated. Within that dialogue, the character named Timaeus had argued that the sensible cosmos belongs in the class of things that are generated, so that it must have a demiurgic cause, yet he had insisted that the cosmos remains perpetually in existence because of the goodwill of that divine craftsman. Such apparently conflicting claims led to an interpretive crux within the early Academy when Aristotle | took Plato [136] literally to be saying that the sensible cosmos is generated and so perishable, whereas Xenocrates and Crantor took him to be speaking metaphorically for the sake of explication, just as one does in talking about the construction of eternal geometrical objects.[2] For Proclus, however, the problem is resolved by placing the sensible cosmos within the Neoplatonic hierarchy of causes that descends from the transcendent One through the intelligible realm and into the sensible realm.[3] More specifically, he reformulates the problem in terms of the question of whether or not the sensible cosmos is self-constituted. Since it is not, according to him, then there must be some other higher cause on which it depends, and so Proclus undertakes the task of relating it to a hierarchy of causes that culminates in the One.[4]

I. *Proclus' Principles of Interpretation*

From our modern hermeneutical perspective, Proclus' commentary appears deceptively like an 'open book' because he gives us so much information in his Prologue as to how he proposes to read Plato's *Timaeus*. For instance, he declares the literary genre or character of the dialogue to be a Pythagorean/Socratic inquiry into causes, which is not only physical but also theological in character. According to Proclus, the *skopos* or purpose of the *Timaeus* is to discuss the most perfect achievements[5] of natural science and

[2] The typical formulae associated with this view are *didaskalias* (or *theôrias*) *charin* and *saphêneias* (or *theôrias*) *heneka*, which Theophrastus reported with reference to the Academy, according to Philoponus; cf. *Aet*. VI.8.145.20 ff.; VI.8.148.7 ff.; VI.21.188.9 ff.; VI.27.220.22 ff.

[3] See Plotinus II.9 [33] 3.1–14; VI.1 [10] 6.37 ff.

[4] In this respect, Proclus seems to accept the monism of Plotinus in taking the One to be the single and ultimate cause of all things, including matter; cf. *In Tim*. I.370.13–371.8. By contrast, for instance, Atticus is rather unorthodox in treating pre-cosmic matter as independent of any divine cause; cf. *In Tim*. I.283.27–285.7; 384.2.

[5] Carlos Steel has informed me that *horoi* is often used by Proclus to refer to whatever provides perfection, measure or structure; cf. *In Remp*. I.247.24; *In Tim*. II.194.10.

to pay attention to the principal causes of nature (*In Tim*. I.1.17–24). Obviously, however, Proclus has imported into his interpretation an Aristotelian understanding of the causes and of their history in Greek physiological speculation.[6] Thus, for instance, he says that the material cause is to be found already among the natural philosophers (I.2.11–15), while the enmattered formal cause is discussed in Aristotle's *Physics* (I.2.15–20). However, he thinks that proper efficient causes, along with paradigmatic and final causes, can be found only in the Pythagoreans or in Plato (I.2.29–3.5). Within the context of such a historical review, Proclus criticises Aristotle's notion of efficient cause as not being truly efficacious (*drasterion*). By contrast, according to Proclus, Plato uses the accessory causes (*synaitia*) to serve merely as instruments of generation for the primordial causes (*tas protourgous aitias*), i.e. the efficient, the paradigmatic and the final causes. For that reason, as Proclus explains, Plato established outside the universe a demiurgic Intellect or Intelligible cause within which the universe pre-exists as a model, as well as the Good which is the pre-established object of desire for creative Intellect (*In Tim*. I.3.4–7).[7]

In relation to Proclus' initial discussion of the *skopos* of Plato's *Timaeus*, we should notice several important points. Despite what Plato may have said about a 'likely story', Proclus considers Platonic physics to be exact (*akribeia*) and this means that it can be set out deductively from first principles, as Proclus himself tried to do for Aristotle's treatise on motion | in his *Elements* [137] *of Physics*. Thus he regards the first part of the *Timaeus* as being concerned with the true causes of the cosmos (i.e. the transcendent, efficient, and final causes), whereas the latter part of the dialogue, dealing with the Receptacle and embodied forms, is seen as belonging to Presocratic and Aristotelian types of physical inquiry. Consequently, Proclus holds that part of the purpose of the *Timaeus* is to study the primary causes of the universe, ascending through the hypercosmic deities from the demiurge (Intellective) to the living Intelligible, and ultimately to the One. It is within the context of such a *skopos* for the *Timaeus* that we should understand Proclus' question

[6] Alain Lernould has suggested to me that Proclus' tendency to reconcile Plato and Aristotle is consistent with the Pythagorean tradition of cultivating friendship as part of the effort to reunite ourselves with the divine; cf. Iamblichus, *Life of Pythagoras*, sections 229 and 240.

[7] According to Proclus, it is the presence of the Good in the demiurgic intellect that enables it to be creative and productive (*In Tim*. I.361.6–16). Thus, within the divine demiurge, the triad of efficient, paradigmatic and final causality is a manifestation of the creative power of the Good or the One; cf. *In Tim*. I.363.9–364.23, 368.15 ff., 388.9–28.

about the self-constitution of the universe, given that there is no such explicit question in Plato's text.[8] Similarly, Proclus pursues in great detail the question about the identity (and triadic constitution) of the demiurge, which Plato had left vague and open-ended.

We can see how these preoccupations influence the *divisio textus* for the *Timaeus* given by Proclus at *In Tim*. I.4.6–6.16. He refers back to the target (*skopos*) being aimed at (*stochazesthai*) in Plato's *Timaeus*, namely, to show that the cosmos is a god, endowed with a soul and an intellect, and having characteristics produced by a demiurgic Intellect, which makes it a copy of the model in the Living Intellect with the participation of the Good. Assuming this to be the purpose of the *Timaeus*, Proclus outlines the following division of the text:

(a) the order of the universe is made visible through images;
(b) in the middle, the whole creation of the cosmos is presented;
(c) finally, the partial works and last achievements of the demiurges are presented.

Under the second (b) division, Proclus discusses Plato's teaching about the demiurgic or efficient cause of the universe, as well as about the paradigmatic and final causes. He takes this section to be an inquiry into causes, and hence to be exact, despite what Plato says about the *Timaeus* being an *eikos logos*.

In this way, Proclus treats the so-called 'hypotheses' (*Tim*. 27d5–28b5) and 'demonstrations' (28b5–29d5) as presuppositions or assumptions (*In Tim*. I.4.28, I.8.26–28) of Plato's treatise about the demiurgic ordering of the whole universe.[9] For him this inquiry has a status superior to that of physics, since it deals with the higher principles; and so it is partly theology. Thus he emphasises Plato's separation of *Timaeus* 27d5–29d5 from the rest of the dialogue, by considering it almost as if it were a self-contained treatise on causes.[10] Subsequently, he treats the creation of the body and soul of the universe as a production of the universal demiurge, before the task of creating

[8] In some written comments on an earlier draft, David Runia has pointed out that the question of whether the cosmos is self-constituted is hardly extraneous to the concerns of the dialogue, especially if we broaden the perspective with a reference to *Laws* X, where the question of whether the cosmos is by design, nature or by chance is discussed. See also Runia 1997, where he argues that the Proemium of the *Timaeus* should be treated as a dialectical exercise, beginning from hypotheses, like that found in Plato's *Phaedrus* as a prelude to a mythical discourse.

[9] See also *In Tim*. I.235.32–238.5 for a detailed discussion by Proclus of this topic.

[10] David Runia has pointed out to me that Proclus is following the lead of Plato in making this separation of the Proemium from the rest of the dialogue. See Runia 1997.

mankind is handed over to secondary (and particular) demiurges. In general, therefore, I agree with Alain Lernould (2001: 73) when he claims that Proclus' division of the text of the *Timaeus* conforms very well with Proclus' own plan
[138] for his commentary. First there is the Proemium or | Prelude in which the Hypotheses and Demonstrations are discussed. Then there is a discussion of the creation of the universe and its parts through the action of the universal and particular demiurges, which takes up most of the extant commentary by Proclus. Finally comes the topic of the last achievement of the particular demiurges in shaping the matter of the cosmos to suit the immanent forms, which is projected for the latter (non-extant) part of the commentary on the *Timaeus*.

Subsequently (*In Tim*. I.7.17 ff.), when specifying the genre (*eidos*) or character of the dialogue, Proclus reports as universally accepted that Plato was inspired by a book from Timaeus the Locrian.[11] He also takes as agreed, by those familiar with Plato's writings, that the character (*ethos*) of the dialogue is Socratic, namely, as displaying *philanthropia* and as giving proofs. So, within this dialogue, Plato combines the spirit of Socrates with that of the Pythagoreans.[12] According to Proclus, the dialogue adopts from the Pythagoreans their sublimity of spirit, their intellectuality, their inspiration, their tendency to make everything depend on the intelligible, to define everything by numbers, to express things through symbols, and to prove things mystically in an elevated tone. On the other hand, the dialogue adopts from Socrates his conviviality, his good spirit, the tendency to give proofs, the capacity to grasp reality through images, his ethical character, and all such things. Therefore the dialogue itself is solemn, holy, and it deduces from above (*anôthen*) all its conclusions from first principles (I. 8.2–3: *apo tôn prôtistôn archôn*), while it mixes the apophantic with the demonstrative (*apodeiktikon*). Furthermore, he claims that the dialogue presents for consideration natural things, not only physically but also from a theological perspective (*In Tim*. I.8.4 ff.). By way of justification for this latter

[11] It is an interesting hermeneutical question (which I cannot discuss here) as to why the Middle Platonic tradition felt it necessary to invent a work, *Peri phusios kosmô kai psuchas*, which was written in Doric and attributed to Timaeus of Locrus. Perhaps it was an indirect appeal to the authority of Pythagoras, since Aetius II.4.1 reports as the view of Pythagoras that the cosmos is *genêtos kat' epinoian*, which looks very like the view of Xenocrates and Crantor, who may themselves have appealed to the authority of Pythagoras; cf. Baltes, 1976, I: 94–96.

[12] This remark seems to imply for Proclus that the *Timeaus* dialogue combines the scientific character of both mathematics and dialectic, with the latter being the higher science which proves the hypotheses of mathematics; cf. *In Eucl*. 42.16; *In Parm*. 986.29.

claim, Proclus argues that Nature herself can guide the corporeal on the right lines only insofar as she herself is dependent on the gods and is permeated by their inspiration. Nature neither possesses fully the quality of the divine nor is she completely deprived of divine properties, since she is illuminated (*proslampesthai*) by the gods. In addition, given that it is appropriate to assimilate the discourse to the realities which it interprets, as Timaeus says (*Tim*. 29b), then it is also proper (*prepon*) that the dialogue have not only a physical but also a theological character in imitation of Nature (*mimoumenon tên phusin*), which it studies.

If one had any doubts about the hermeneutical orientation of Proclus' commentary, they should be laid to rest by his digression on the notion of *phusis* (*In Tim*. I. 9.31 ff.). Since the *Timaeus* sets out to examine Nature, it would be proper to know what is nature (*tis hê phusis*) and from what it proceeds (*pothen proeisi*) and how far (*mechri tinos*) it extends its productions. Proclus now gives a typical Aristotelian review of predecessors on the use of the term *phusis*, which is clearly inspired by Aristotle's survey in *Physics* II. For instance, Proclus refers to Antiphon giving the name *phusis* to matter (*hulê*), and to Aristotle who gave the same name to form | (*eidos*) in many [139] places (*Phys*. II, 1, 193a28), while others gave the name to the whole (*to holon*), as Plato reports in the *Laws* (X, 892b), where the name is applied to naturally produced things. Others gave the name *phusis* to natural powers or qualities such as heavy/light, density/fineness, like some Peripatetics and older natural philosophers. Again others called 'nature' the artifice of the divine (*technê theou*), while others called it soul (*psuchê*).

By contrast, according to Proclus, Plato refuses to give the name *phusis* in its primary sense (*prôtos*) to matter or to the enmattered form or to body (*sôma*) or to natural powers. Yet he also hesitates to call soul itself nature, though (again according to Proclus) he gives us the most correct teaching on nature by placing it in the middle between soul and the bodily powers because, on the one hand, it (nature) is inferior to soul by virtue of being dispersed through bodies and not returning to itself (*mê epistrephei eis hautên*); whereas, on the other hand, it is superior to what comes after it by virtue of containing the creative seeds (*logoi*) of everything and by virtue of generating living things. According to the common notions (*koinai ennoiai*), one must distinguish between nature (*phusis*), according to nature (*kata phusin*), and by nature (*têi phusei*). Since the product of art is different from the art itself, Nature is no less different from the intellective soul (*In Tim*. I.10.24: *psuchê noêra*). For Nature belongs to bodies, since it plunges into body and is inseparable (*achôristos*) from it, whereas soul is separate (*chôristos*) and is rooted (*hidrutai*) in itself, while simultaneously belonging

to another. On the one hand, soul does participate in another thing (body) but, on the other hand, it does not veer (*neuein*) towards the participant, so that it belongs to itself, just as the father of the soul is not participated but belongs uniquely to himself.

Eventually (*In Tim.* I.12.26 ff.), arising out of his extended discussion, Proclus provides a summary definition of 'nature' according to Plato: namely, an incorporeal essence (*ousia asômatos*), which is inseparable from bodies (*achôristos sômatôn*), which has in itself the creative principles (*logoi*) of bodies, and which is incapable of looking back to itself (*eis heautên horan*).[13] According to Proclus, it is clear from this definition in what way the dialogue, which discusses the making of the whole cosmos, is 'physical' (*phusikos*). But notice that he is careful to retain the theological dimension of 'higher' causes throughout his discussion of nature.

At this point (I.13.1 ff.), Proclus makes some revealing classificatory remarks. According to him, the whole of philosophy is divided into a theory of intelligibles (*peri tôn noêtôn*) and a theory of encosmic beings (*peri tôn enkosmiôn*), since the cosmos is double (*ditton*), i.e. the intelligible (*noêtos*) and the sensible (*aisthêtos*), as Plato himself says (*Tim.* 30c9). But the *Parmenides* contains the treatise on intelligibles, while the *Timaeus* deals with encosmic beings; the first dialogue teaches us about all the divine classes of being, while the latter deals with all the procession (*proodos*) of encosmic beings. Yet the
[140] *Parmenides* does not completely neglect the | theory of beings within the universe, nor does the *Timaeus* neglect the theory of intelligibles, because the sensibles are in the intelligibles paradigmatically (*paradeigmatikôs*), while the intelligibles are in the sensibles iconically (*eikonikôs*).

Still, the *Timaeus* is more concerned with the physical domain (*peri to phusikon*), whereas the *Parmenides* is concerned with the theological domain (*peri to theologikon*), in conformity with the persons after whom these dialogues are named. For, according to Proclus, the historical Timaeus had written a physical treatise concerning the universe (I.13.13–14: *gramma peri tês tou pantos … phuseôs*), just as the historical Parmenides had written a treatise about real being (*peri tôn ontôs ontôn*). Thus, according to Proclus, Iamblichus was correct in saying that the whole philosophy of Plato is contained in the two eponymous dialogues, given that everything which concerns the encosmic beings and the hypercosmic beings is to be found completed in these dialogues, and there is no class of beings which is left unexplored.

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[13] See also *In Tim.* I.11.9–19 for a preliminary account of nature, according to Proclus.

Significantly, Proclus claims (*In Tim*. I.13.20) that there is a deep similarity between the modes of presentation in the *Timaeus* and in the *Parmenides*; for just as Timaeus traces the cause of things in the universe back (*anagei*) to the demiurge, so also Parmenides makes the procession (*proodos*) of all things depend on the One (*exaptei tou henos*). In other words, the *Timaeus* shows how everything participates in the providence of the demiurge, while the *Parmenides* shows how everything participates in the completely unitary essence. In addition, just as Timaeus considers encosmic beings in the mode of images before engaging in the science of Nature, similarly Parmenides makes an inquiry into immaterial forms prior to engaging in theology. Just as in the *Timaeus* it was necessary first to practise by means of discussion of the best political regime before ascending to grasp the universe, so also in the *Parmenides* it was necessary to exercise one's mind with the challenging difficulties about the Forms before ascending to the mystical contemplation of the henads.

One thing that may appear odd to us as modern readers of Plato's *Timaeus* is the rather sharp distinction which Proclus tries to make between Platonic and Aristotelian senses of cause. What is particularly striking is his describing as *sunaitia* such forms and matter as are embodied in the sensible universe, since in his physics Aristotle treats form and matter as causes in the full sense. Despite Aristotle's report that Plato separated the Forms, one might even conclude that the Platonic causes are not much different from the Aristotelian. Hence we may find rather strained the emphasis which Proclus puts on the higher 'theological' status of the Platonic causes, such as efficient, paradigmatic and final causes which are integral to the role of the creative demiurge. But, once again, I think this emphasis must be understood within the context of a Neoplatonic hierarchy of causes, which represents a substantive development beyond the thinking of both Plato and Aristotle. One must take | account of Proclus' typical Neoplatonic attempt to reconcile [141]
the Platonic and Aristotelian doctrines of causality by treating the former as theological and the latter as physical. For instance, in his *Commentary on the Parmenides* (841.26), Proclus conceives of Platonic Forms as being both paradigmatic and creative, thereby combining the notion of a creative demiurge with Aristotle's notion of the divine as a final cause.

II. *Interlude on Prayer*

Perhaps the most revealing glimpse of Proclus's tendency to treat Plato's *Timaeus* as a treatise on the first principles of nature is given through his

peculiar interpretation of the passage where Timaeus invokes the gods to aid him in the project which he is about to undertake. What seems to us like a conventional invocation on the part of Timaeus is seized upon by Proclus as an opportunity for a longish excursus (*In Tim*. II.206.26–214.12) on the cosmological significance of prayer. He proposes (207.21 ff.) to examine the essence (*ousia*) of prayer and its perfection, along with its origin within souls. Consistent with his general approach to the *Timaeus*, Proclus gives the following (208.23 ff.) noteworthy justification of prayer: since we are part of the whole (*tou holou*), it is proper to pray because it is through conversion (*epistrophê*) to the whole that we obtain salvation (*sôtêria*). Such a justification is subsequently (209.9 ff.) clarified in terms of the following starting-point: all beings are progeny of the gods, and they remain rooted in the gods. Thus the One is everywhere, insofar as each thing takes its existence from the gods and, while everything proceeds from the gods, yet it remains rooted in them. Here Proclus is invoking the 'wondrous way' (*thaumaston*) in which effects both proceed from their causes, and also remain in them.

In fact, the typical Procline triad of remaining, procession and return is being invoked here (210.2 ff.) to clarify the function of prayer in the *Timaeus*. When things have proceeded, they must also return, thereby following the triadic motion that brings them to perfection when they are enveloped by the gods and the primary henads. Thus, all things both remain in and return to the gods, so that they receive from Nature (210.18: *para tês phuseôs*) powers and characteristics corresponding to the essences of the gods. According to Proclus (210.27 ff.), this explains why the soul has the double character of 'remaining' (*menein*) and of 'reverting' (*epistrephein*), namely, according to the One it is rooted in the gods, whereas according to Intellect it has the capacity to revert to them. But it is the activity of prayer which realises this capacity for reversion to the gods within the soul. In fact, the ultimate goal of prayer for Proclus is the complete union of the soul with the divine, when the one of the soul and the one of the divine constitute a single activity. But, on the way to this goal, several stages must first be reached through prayer, e.g. knowledge of classes of the divine, being at home with (*oikeiôsis*) the divine, contact | with the divine, immediate proximity to the divine, and [142] finally mystical union with the divine.[14]

Subsequently (*In Tim*. II.217.24–26), Proclus refers back to the invocation of the gods by Timaeus as evidence in support of his own contention that

[14] See Dillon 2002: 288–290 for a brief account of the different stages of prayer, according to Proclus, that lead the human soul towards mystical union with the divine.

natural philosophy is a kind of theology because natural things have a divine aspect insofar as they are generated by the gods. This claim is made within the context of his general discussion (217.18 ff.) of the different aspects under which one might consider the universe, namely, as corporeal, as participating in both the whole soul and the particular souls, or as having intellect. Indeed, it is the general principle that the word 'logos' can be said in many ways, which he explicitly (218.13) adopts from his teacher Syrianus, that enables Proclus to address a puzzle arising from the text of the *Timaeus*, namely, Plato's use of the word *pêi* at 27c4. Proclus is concerned with this small point of textual exegesis mainly because it has a direct bearing on what he takes to be the central problem of the dialogue, i.e. whether or not the sensible cosmos is generated. For instance, Proclus reports (219.10 ff.) that for Albinus the cosmos is eternal in a way (*pêi aei ôn*) or, as Proclus explains, in a way generated but in another way ungenerated. Thus Albinus belongs among the older interpreters (218.1 ff.) who take the particle *pêi* in this double way.[15] Having considered and rejected some interpretations of previous exegetes like Iamblichus, Proclus concludes that *pêi* does not refer directly to the universe itself but rather to different ways of speaking about it, namely, either intellectually (*noêrôs*), or scientifically (*epistêmonikôs*), or didactically (*didaskalikôs*).

III. *The Demiurge as Efficient Cause of the Sensible Cosmos*

However, it is with regard to the principal 'hypothesis' of the *Timaeus* that we can see the full consequences of Proclus' hermeneutical assumptions about the dialogue. Firstly, as the starting-point of the whole inquiry, he identifies the leading question of whether the sensible cosmos is generated or ungenerated. Before giving his own answer to the question, he reviews in a typical Aristotelian manner the answers given by some previous commentators, which are reflected in particular readings of the text of the *Timaeus*. On the one hand, there is Albinus who interprets the question of whether the universe is generated as being about whether it has a more ultimate cause.[16]

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[15] Plutarch (*Procr. An*. 9.1016d) has a similar double intepretation of *pêi*, and this seems to be part of the tradition of taking 'generation' in many different senses (*In Tim*. I. 340.25).

[16] We should notice the significance of Albinus as foreshadowing Proclus' own more elaborate solution. In the *Didaskalikos* 14.3, 169.26 ff., once confidently claimed for Albinus, it is argued that Plato's talk of the 'generation' of the cosmos should not be taken literally but rather as saying that it is always in generation, and so is in need of some higher cause for its

On the other hand, Porphyry and Iamblichus take the question to express a standard aporia as to whether or not the sensible universe is generated. In fact, according to Proclus, the correct answer to this question is of the greatest importance for the whole science of physics. Beginning from this starting-point (*ek tês hupotheseôs*), he thinks we can discern the character of the universe according to its essence (*ousia*) and powers (*dunameis*), as will become clear later (*In Tim.* I.227 ff.). So he makes the following preliminary
[143] statement (219.28–31): 'Let us say that | the discourse about the universe is undertaken for the sake of instruction (*didaskalias heneka*),[17] beginning from the hypothesis of whether the universe is generated or ungenerated, and from this starting-point drawing out all the other things as consequences.'

Now let us consider some of Proclus' comments (*In Tim.* I.258.8 ff.) on Plato's axiom at *Timaeus* 28a: 'Everything which is generated must be generated by some cause.' Proclus takes Plato to be proceeding according to the geometrical method of assuming basic axioms, having already set down his definitions. In other words, after defining 'what is being' (*ti to on*), and 'what is generated' (*ti to gignomenon*), Plato posits (*prostithesi*) other common notions (*koinai ennoiai*), i.e. that everything which is generated comes to be from some cause, and that it is impossible for something to come to be, unless it is generated from some cause, and that the product is beautiful if it is created according to an eternal paradigm. Proclus insists that Plato is not referring here (*Tim.* 27d5) to his method of division, but is rather making distinctions between his basic principles (*In Tim.* I.226.22–29).

Proclus (258.23–26) adopts an Aristotelian analysis when he distinguishes between one proposition as a middle term (*hôs meson*) and the other as conclusion (*hôs sumperasma*); the first is most evident, while the latter is less evident and less clear. Thus Proclus analyses the whole argument in terms of a categorical syllogism:

> Premise 1: It is impossible for anything generated to be generated without a cause;
>
> Premise 2: But everything for which it is impossible to be generated without a cause is necessarily generated from some cause;
>
> Conclusion: Therefore, everything generated is necessarily generated by some cause.

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existence. In other words, the cosmos is not self-subsistent but rather dependent on some higher cause such as a continually creative god; cf. Baltes 1976, I: 96 ff.

[17] Although the implicit reference to the view of Xenocrates and Cantor is unmistakable in the language, yet Proclus is rather following Iamblichus in taking Plato's talk of 'generation' in the *Timaeus* as 'theoretical' or hypothetical.

In reflecting on the ontological reason why the middle term in this syllogism is clearer than the conclusion, Proclus suggests (259.19 ff.) that it is easy to understand how, if something generated is separated from its cause, then it will lack power and force (*adunaton esti kai asthenes*), since it cannot conserve itself (*heauto sôzein*), nor is it maintained through itself (*mêd' huph' heautou sunechomenon*). Since it does not contain within itself the cause of its conservation and coherence, it is clear that, if it is separated from that cause, it will be reduced by itself to impotence (*hôs adunaton*) and will tend to disperse into non-being. For Proclus (259.24–27) what this shows is that any generated being cannot come into being without a cause, because if it came into being it did so through the action of a producer (*hupo tinos gignetai poiountos*). In support of his interpretation, Proclus cites the *Philebus* (26e2–4, 27a1 ff.) where Plato posits a producer (*to poioun*) for what is produced or generated. But this producer must either be a self-producer or be produced by something else. If it is produced by itself then it is a being which is eternal.

In another of his revealing digressions, Proclus (*In Tim.* I.260.19–261.1) | [144] discusses the metaphysical implications of Plato's concept of *aition*. By means of the term 'cause' (*aition*), Plato reveals the unique character (*henoeidê*) of the demiurgic principle, in the sense that the name 'cause' indicates that which produces (*to demiourgikon*) and not simply that which sustains (*to hupostatikon*) another thing. Notice that in insisting upon the singularity of the efficient cause here (cf. also 262.2), presumably so as to distinguish it from the formal and final causes, Proclus seems to imply that the term 'cause' belongs most properly to efficient causality.

This implication becomes explicit when Proclus subsequently (261.1 ff.) considers the different senses of 'cause' according to Aristotle, which he presumes that every exegete of Plato would have in mind. By contrast with Aristotle's four causes, Plato espouses three senses of cause and of accessory cause (*sunaitia*). However, while acknowledging these different senses of cause in Plato and Aristotle, Proclus insists that for Plato the efficient cause is most strictly a cause, and so Proclus remarks (261.23–25) on his talk about a 'certain cause' (*aitiou tinos*) being responsible for generation. He insists that Plato has in mind the efficient cause when he talks about the intellect of the universe (*ho nous tou pantos*) and the soul and nature.[18] Even though there

[18] Proclus later, *In Tim.* I.267.4, castigates Aristotle for departing from the authentic Platonic teaching when he traces the so-called 'upward tension' towards the unmoved mover, without tracing the downward chain of causal dependence.

is a multiplicity of effects and of causes, there is not a plurality of efficient causes for a particular effect, and hence Plato is correct to talk about a 'certain cause' because a particular effect is always created by a certain cause, and not by all of them.

As is well known, Proclus' own interpretation of Plato's question of whether or not the sensible cosmos is generated, rests on a long tradition of distinguishing between different senses of 'generated'.[19] There is no need for me to rehearse these distinctions here, though I do want to draw attention to Proclus' (*In Tim*. I.293.6–294.28) own way of resolving the apparent contradiction involved in Plato saying that the sensible cosmos is generated and yet never perishes. For Proclus (293.15–20) there is a crucial distinction to be made between the cosmos being imperishable in the temporal sense of lasting throughout all time,[20] and being perishable in the sense of being incapable of conserving itself in existence. It is in the latter sense that the sensible cosmos is perishable, precisely because it is corporeal.[21]

It may be worth while for us to dwell briefly on Proclus' argument for this conclusion, while also paying some attention to the language in which it is couched. He claims that no body has the capacity to generate itself or to preserve itself in existence. First he argues that every generator is an efficient cause, and that every efficient cause is incorporeal (293.24: *pan de to poioun asômaton esti*). By way of justification for this rather unAristotelian conclusion, Proclus argues that, even if the mover is a body, it creates something by means of incorporeal forces (*dunamesin asômatois*). Therefore, every generator is incorporeal, and everything which has the capacity for conserving something also produces the double effect of unity and indissolubility. Thus, everything which produces such an effect | is [145]
itself indivisible (*ameres*). Therefore, Proclus concludes that, whatever has the capacity for preserving itself (*to heautou sunektikon*) cannot be a body because holding together (*to sunechein*) does not belong to body, which is divisible insofar as it is a body.

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[19] For some of these senses of 'generated' in Taurus and Porphyry, see Philoponus, *Aet*. VI.8.145.7–147.25, 148.7 ff.; VI.10.154.6 ff.; VI.23.193.25 ff.; VI.25.200.10 ff.; VI.27.223.8–19.

[20] With respect to things which exist in time, Proclus distinguishes elsewhere (*ET* Prop. 55) between those which have a perpetual duration (*aei chronon*) and those which have a dated existence in a part of time (*en merei chronou*). Obviously, it is in the first sense that the sensible cosmos exists in time.

[21] For Neoplatonists like Proclus, the fact that the cosmos is sensible and corporeal does not imply that it must have a temporal beginning but rather having such qualities implies lack of unity or simplicity, lack of independence or, more specifically, dependence on a higher cause; cf. Simplicius, *In de Caelo* 299.22.

Although he is quite clearly drawing on Aristotle's *Physics* for some of his claims about body, Proclus explicitly appeals to Plato's *Sophist* (246a7–c2) where the view of the materialists that everything is bodily is critically examined. On this basis Proclus argues that what holds bodies together is something indivisible (*In Tim.* I.294.1: *to sunechon ameres*); so that, even if what is conserved is corporeal (as in the case of the sensible cosmos), it is not the body which conserves itself but rather something incorporeal that preserves it. Thus, using an emphatic *anankê*, Proclus concludes that, necessarily, whatever conserves itself is indivisible (294.2–3: *ameres einai to huph' heautou sunechomenon*). Terminologically, what is noteworthy about this whole argument is that Proclus does not use the familiar contraries of *authupostaton* and *anhupostaton* with reference to the mode of being of the sensible cosmos. The first of these terms is only briefly mentioned earlier (*In Tim.* I.277.8–32) in an ostensible historical reference[22] to Crantor and the Academic view that the sensible cosmos is not self-generated or self-constituted (I.277.9–10: *ouk onta autogonon oude authupostaton*).[23] Significantly, however, Proclus declares (I.277.14–15) what he takes to be the Academic interpretation of the *Timaeus* to be the most true.

So, when Plato describes the sensible cosmos as something which is generated, this is taken by Proclus to mean that it has a cause other than itself and, therefore, that it does not belong among those higher beings which are self-constituted. For further clarification of this notion in Proclus, we might perhaps refer to his *Elements of Theology*, Proposition 40, which states that everything which proceeds from another cause is subordinate to principles which get their substance from themselves and have a self-constituted existence.[24] This notion may be further clarified through Proposition 42,

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[22] J. Whittaker 1975 has shown convincingly that Crantor could not have used the term *authupostaton*, whose use Dillon (1973: 303) dates as late as Iamblichus. Whittaker also points out that no usage of *autogonos* can be reliably dated before Porphyry. According to Whittaker, Proclus mistakenly attributes to Crantor what was historically a Middle Platonic response to the Stoic thesis that the cosmos is self-caused. However, as Lernould 2001: 244n40 notes, Proclus is contrasting Crantor, not with the Stoics, but with Plutarch and Atticus, who both interpret the *Timaeus* discussion of generation in a strong temporal sense.

[23] At *In Tim.* I.232.12 ff. Proclus elaborates on the contrast between *authupostaton* and *anhupostaton* in terms of the superiority in being of what is self-constituted over what is dependent on an external cause for its existence. But, given that he accepts the Plotinian monistic system in which everything depends on the One as an ultimate cause, it is unclear how there can be such self-constituted or independent things; cf. *Enn.* IV.8 [6] 6.1–28.

[24] The argument in Proposition 40 seems to depend on that of Proposition 9 that whatever is self-sufficient (*autarkes*), either with respect to being (*kat' ousian*) or activity (*kat' energeian*), is superior (*kreitton*) to anything that is dependent on another as the cause of its completeness.

which states that everything which is self-constituted is capable of reversion upon itself. But Proposition 44 states that everything which is capable of reversion upon itself in respect of its activity is also reverted upon itself in respect of its existence. However, we know from Propositions 15 &16 that self-reversion is characteristic of incorporeal entities, so that we may infer that it does not belong to corporeal things like the sensible cosmos. This inference is confirmed by Propositions 45 and 46, which taken together state that everything which is self-constituted is ungenerated (*agenêton*) and imperishable (*aphtharton*). This is further confirmed by Proposition 47, which states that everything which is self-constituted is without parts and simple. Thus, as Proposition 49 claims, everything which is self-constituted is eternal. Conversely, as Proposition 48 makes clear, everything that is not eternal either is composite or has its subsistence in another.

[146] Such propositions about the self-constitution of the cosmos only make sense within a Neoplatonic hierarchy of being, given that Proclus' intention is to establish the inferior position of the sensible cosmos within that schema, and thereby establish the necessity of higher explanatory principles such as Forms and Intellect. In his *Parmenides* commentary (*In Parm.* 786–787), for instance, the argument has the typical structure of a *reductio ad absurdum*: If this sensible cosmos were self-constituted, many absurd results would follow. For whatever is self-constituted must be without parts, since everything that creates and everything that generates is altogether incorporeal. Proclus claims that even bodies themselves produce their effects by means of incorporeal powers, e.g. fire produces heat (by hotness). Assuming that whatever creates must be incorporeal, and since in a self-constituted thing it is the same thing that creates and is created, then the self-constituted thing must be altogether without parts. But the physical cosmos does not have such a character, since every body is divisible in every way; and so the cosmos is not self-constituted.

Within this passage in the *Parmenides* commentary, Proclus goes on to argue that the cosmos is not self-activating, in contrast to self-constituting things which are self-generating, and so naturally able to act on themselves. In effect, the argument is that the cosmos is not self-moving, since it is corporeal. Thus the cosmos derives its being from some other cause which is higher. But this leads Proclus to raise a related question about whether this cause acts by rational choice, or whether it produces the universe by its very being. If it acts by deliberate choice, its action will be unstable and variable; so that the resulting cosmos would be perishable.[25] Judging from Plato's account of

[25] Cf. Plotinus, III.2, for a similar rejection as inappropriate of talk about the demiurge

the creative activity of the demiurge in the *Timaeus*, one might think that he accepted this implication about the perishability of the cosmos, even if it never actually perishes (*Tim.* 41a–b). But Proclus claims that, since the cosmos is sempiternal, what creates it must do so by its very being or essence (*autôi tôi einai*).[26] In fact, Proclus says (*In Parm.* 787.1), everything which acts by deliberate choice necessarily has some creative activity that it exercises by its very being, e.g. our soul does many things by choice but it gives life to the body by virtue of its very essence. In this argument he is appealing to a general principle of Procline metaphysics (*ET* 57), namely, if the power of creating by its very essence extends more widely than creating by deliberate choice, then it flows from some higher cause. Proclus explains that such creative activity is effortless, and is also characteristic of the divine.[27]

These parallels from *Elements of Theology* and the *Commentary on Plato's Parmenides* provide some of the metaphysical reasons[28] as to why Proclus holds that the sensible cosmos is not self-constituted but rather depends for its subsistence on the demiurge as an external cause of its existence. However, this conclusion is also clear from his commentary on | the *Timaeus*, [147] which argues in terms of the efficient causality of the demiurge with respect to the sensible cosmos as a product.

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planning or choosing to create the sensible cosmos, since there must be an eternal product of an eternally active cause. According to Plotinus II 9 [33] 7.1 ff., the cosmos is a natural image (*phusei eikôn*) of an eternal Paradigm, and the eternity of the copy follows from the eternity of the paradigm; cf. *Enn.* V.8 [31] 12.17–26; Proclus, *In Parm.* 824.28 ff., 911.1 ff., 1129.15 ff. This orthodox Neoplatonic argument is also used by Proclus in Argument II of his *On the Eternity of the World*.

[26] In his criticism of Atticus for accepting the temporal generation of the cosmos, Proclus argues that, since the demiurge is eternally creative, the universe must be sempiternal and coextensive with the whole of time (*In Tim.* I.366.20–25 and 367–368 *passim*).

[27] A corollary of *ET* 34 states that all things proceed from Intelligence (*nous*), since it is an object of desire for all things. Thus, according to Proclus, it is from intelligence that the whole world-order (*kosmos*) is derived, even though the latter is sempiternal. Perhaps this represents another attempt to reconcile Plato's talk of the 'generation' of a cosmos in the *Timaeus* with the Academic tradition that the world-order is eternal. If the procession is logical rather than temporal, intelligence can proceed eternally and be eternally reverted, while still remaining steadfast in its own place in the cosmos.

[28] I accept that Proclus' commentary on the *Timaeus* is temporally prior in composition to his *Elements of Theology*, but this does not prevent us from using the latter to clarify the former. I am indebted to Marije Martijn for the plausible suggestion that many of the metaphysical principles formulated in *ET* may have been provoked by interpretative difficulties arising from apparent inconsistencies in the *Timaeus* commentary.

Conclusion

Thus, once again, I find myself in agreement with Alain Lernould (2001: 159) about Proclus' guiding idea in his explication of *Timaeus* 27d6, namely, that the sensible cosmos is generated according to its essence (*kat' ousian*). Proclus' interpretation of Plato's distinction between eternal and generated being is guided by the idea that the universe is generated in this double sense: (1) that it does not have in itself the principle of its own existence (*anhupostaton*)—by contrast with beings that are self-constituted (*auth-upostaton*); (2) and that it has its essence in time, even if it lasts throughout all time. These two meanings of the 'generation' of the cosmos are contained in this single thesis that the cosmos is generated according to its essence. This thesis results from Proclus' application to the sensible cosmos of the first hypothesis of the *Timaeus*. Thus, in the first part of his interpretation, Proclus devotes his efforts to distinguishing the cosmos which is always (*aei*) generated, insofar as it is sensible, not only from intelligible being, which is always (*aei*) eternal, but also from soul, which is intermediate between sensible and intelligible being.

I think it is clear that Proclus is conscious of standing at the end of a long tradition of interpreting Plato's *Timaeus* that goes right back to the early Academy, and obviously this tradition dominates his whole interpretation of the dialogue. For instance, he feels obliged to adopt a solution to the old problem of whether or not the sensible universe is generated, and his answer to this question influences the way in which he reads Plato's *Timaeus*. Significantly enough for our knowledge of that whole tradition, the question takes up so much space in Proclus' commentary that it has become the major source for scholars who want to discover the views of obscure Middle Platonists or even of better known Neoplatonists on this and related questions. For instance, he reports the minority Platonic view of Plutarch and Atticus, who took Plato literally as saying that the sensible cosmos is temporally generated. By contrast, Proclus refuses to take such talk of generation literally, arguing that the ontological dependence of the sensible universe on the creative demiurge does not involve creation in time. Having adopted a solution to the traditional problem, Proclus proceeds to read the whole dialogue in this light, while criticising alternative readings based on different solutions. In this way, Proclus continues the long tradition of reading Plato's *Timaeus* in the light of a particular solution to the leading metaphysical question about the relationship between the sensible universe and a creative demiurge.

THE RATIONALITY OF THE REAL: PROCLUS AND HEGEL

Introduction

Although system-building in philosophy has fallen into disrepute in this century, it is not because the perennial temptation to systematise has been finally overcome by something definitive like Gödel's incompleteness proof in mathematics. On the contrary, it is usually when some attempt to construct a system has failed that philosophers become temporarily disenchanted with the whole systematic approach, only later to resume their efforts from a new direction.[1] In view of this historical pattern, I think it is legitimate to wonder about the philosophical attraction of systems. Thus, taking Proclus and Hegel as ancient and modern systematisers respectively, I want to consider some questions about their motivation for constructing systems. For instance, why does Proclus systematise the metaphysical tradition stemming from Plato, Aristotle and Plotinus, given that these were aporetic rather than systematic thinkers.[2] Arguably, his concept of system is drawn from mathematics, as evidenced by his *Commentary on Euclid* and by his *Elements of Theology*, so perhaps he wished to construct a definitive science based on this Greek model. But I want to suggest that religion was also a motivating factor, since we know from the *Life* written by his follower Marinus that Proclus zealously practised cult worship and theurgy. Thus, he may be completing the Iamblichean project of justifying pagan theology against the Christian faith, or he may be constructing a systematic science of theology as his own unique project.

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[1] For instance, one could take the Vienna Circle to be reacting against Hegelian systematising, though one of the goals of their 'unity of science' project was to assemble a unified encyclopaedia of the sciences.

[2] Despite persistent attempts to reconstruct Plato's 'unwritten doctrine', it is clear that his extant dialogues are unsystematic in the sense that each constitutes its own dialogical space which is not systematically related to other dialogues. Although Aristotle does develop a body of doctrine in his own name, he cannot be said to have constructed a philosophical system in any modern sense, because he sharply differentiates the sciences from each other and adopts an aporetic approach in all of his inquiries. While one could reconstruct some kind of Neoplatonic system from the writings of Plotinus, his so-called *Enneads* are unsystematic in that they were written in response to specific questions rather than as a means of setting out any systematic doctrine.

From the philosophical point of view, however, he seems to be searching [32]
for some ultimate ungrounded hypothesis from which to deduce all of reality in a consistent fashion. Although Proclus represents his work as the completion of a Platonic project, it seems that he is pushing too far Plato's search for some adequate hypothesis grounded in language. Not even in the *Parmenides*, which was taken by Neoplatonists to exemplify dialectical theology, does Plato construct the sort of demonstrative science that Proclus presents in his *Elements of Theology*. So we must raise a question about what philosophical problems are being resolved through the construction of such a systematic science. But perhaps we should also entertain the possibility that Proclus had lost sight of the traditional problems of metaphysics, since his system seems to contain petrified answers to the old problems about the one and the many, cause and effect, prior and posterior. Thus, if one wishes to rehabilitate Proclus as an original thinker, one must show how he contributed to the Neoplatonic tradition by systematising it.[3]

There are some clear parallels with Hegel, who resurrected systematic philosophy in the nineteenth century after the scepticism of Hume and the critical philosophy of Kant seemed to have buried it forever. In the Introduction to his *Encyclopaedia*, for instance, he suggests that system satisfies the desire of reason for completeness through the progression from and return to first principles as a genuine ground. According to him, philosophy cannot be a scientific production without being systematic in such a way as to include all particular principles of the empirical sciences.[4] Like Plato before him, Hegel criticises these special sciences for their lack of self-reflection and, on the basis of this critique, he makes rather sweeping claims for the superiority of reason. But Hegel's critique of Newton in his *Dissertation* on the planets also tells us something about his own conception of Nature as an objective embodiment of Absolute Spirit.[5] His major criticism is that such notions as gravity and inertia had not been properly deduced in a systematic way, so that they appear to be accidental rather than essential characteristics of natural bodies. Perhaps this critique is also motivated by Hegel's desire to justify metaphysics as a science, in view

[3] The typical view about Proclus' lack of originality is to be found in A.C. Lloyd's contribution to the *Cambridge History of Later Greek and Early Medieval Philosophy*, where he claims (311) that generally the concepts and hypostases of Proclus are not original but are derived from predecessors like Plotinus, Iamblichus and Syrianus. For spirited defences of Proclus as an original thinker one should consult W. Beierwaltes 1965, and J.M.P. Lowry 1980.

[4] G.W.F. Hegel 1971a: 24.

[5] G.W.F. Hegel 1986.

of the success of Newton's general theory of gravitation, which Kant viewed as a leading paradigm of scientific knowledge.

[33] Since the time of Hume and Kant, however, metaphysics has been steadily losing its legitimacy as a scientific enterprise. By contrast with mathematics and experimental physics, it seems to lack any definite procedure for deciding whether its claims are true or false. Although metaphysical arguments usually conform to the rules of logic, one can only reach true conclusions if one's initial assumptions are true. While the same holds for mathematics, it can be defended as a purely formal discipline concerned only with internal consistency, since there appears to be no independent 'reality' against which one might test its conclusions. But then perhaps a similarly consistent philosophical system could have just as good a claim to being true. If this argument seems plausible then it may help us to appreciate the perennial attraction of Platonism with its emphasis upon the internal consistency of a logical system of Ideas. In this article, I discuss Proclus and Hegel as two eminent exponents of such systematic rationalism in the history of philosophy.

It will be immediately obvious that my choice of thinkers is partly dictated by the fact that Proclus acknowledged the influence of Plato, and that Hegel, in turn, confessed himself to have been deeply influenced by both Plato and Proclus. But while these evident connections guide my initial approach to Proclus and Hegel, I sometimes take issue with their interpretations of Platonism. For instance, Proclus presents his *Elements of Theology* as an unhypothetical science according to the model of Euclid's *Elements*, though there is little solid evidence (despite reports about an 'unwritten doctrine') that Plato developed such a higher science. In order to show that Proclus adopted a mathematical model for his theology, I use his commentary on the first book of Euclid together with his *Elements of Theology*. In the case of Hegel, I correlate his remarks on Plato and Proclus in the *Lectures on the History of Philosophy*[6] with his conceptions of dialectical and speculative thinking as these are revealed in his *Logic*. Perhaps it is an unintentional example of 'the cunning of Reason' that, just like Proclus, Hegel's own philosophical programme seems to involve some creative misunderstandings of the Platonic tradition.[7]

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[6] G.W.F. Hegel, 1971b.

[7] For instance, as Beierwaltes has shown, Hegel's own concept of dynamic negation as an integral element of the One is clearly a misunderstanding of Proclus' concept of the One; cf. W. Beierwaltes 1972: 177–178.

I. *Mathematics as a Procline Model for Systematisation*

We can see the attractions of a comprehensive system for Proclus (*in Crat*. 1.10–2.4) in his arguments for the superiority of what he calls Parmenidean dialectic over Aristotelian syllogism.[8] This hypothetical method is held to be superior to syllogism because it directs our attention more to the | inter- [34]
relationship of the Forms, through its affirmative and negative conditionals. Reflecting the same methodological preoccupation with system, Proclus insists (*in Parm*. 982.11–15, *Pl. Th*. I.9. 40, 10–12) on the correct order in the use of dialectic, i.e. division, definition, demonstration. Proclus promotes division as a method of teaching definitions, even though this method was rejected by Aristotle precisely because of its ontological presupposition that there is a single basic division of all classes and subclasses of reality. In contrast to Speusippus and later Platonists, Aristotle thought that this presupposition is not true of reality, and so he gave only a preliminary and secondary role to dialectical or 'logical' inquiry by comparison with scientific or 'physical' inquiry. In this scheme of things, the Aristotelian theory of the syllogism is not a part of philosophy but rather its instrument or *organon*.

From this perspective, we can appreciate Proclus' comparison of Platonic and Aristotelian logics in his commentary on Plato's *Cratylus*.[9] His criticism of Aristotle's logic as being merely about empty names shows that he regards Plato's dialectic as having a firmer grasp on reality. He also insists that a chain of hypotheses gives a better access to the truth, presumably on the assumption that reality is mapped out by such a logical structure. Finally, Proclus claims that this kind of dialectic is superior to syllogistic because its premises are reached by division which cuts reality at its natural joints, as the butcher metaphor of Plato's *Phaedrus* suggests. All of these claims underline the importance of Platonic dialectic as a guide to reality for Proclus, so we should study his related methodological conceptions. According to remarks in his *Platonic Theology* (I.10.45.19–46.22), the series of hypotheses in Plato's *Parmenides* gives a chain of reasoning in which the first are derived from the fewest, simplest, and most self-evident ideas, which are sometimes called

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[8] My conventional references to Proclus' works are as follows: *In Crat*. = *In Platonis Cratylum commentaria*, ed. G. Pasquali, Leipzig 1908; *In Eucl*. = *In primum Euclidis elementorum librum commentarii*, ed. G. Friedlein, Leipzig 1873; *In Parm*. = *In Platonis Parmenidem commentaria*, from *Opera inedita*, ed. V. Cousin, Paris 1864: 617–1258; *Pl. Th*. = *In Platonis Theologiam libri sex*, ed. E. Portus, Hamburg 1618.

[9] For an excellent recent study of this and related logical issues in Neoplatonism one should consult A.C. Lloyd 1990.

'common notions'. The subsequent hypotheses are less simple and greater in number, and they follow from previous hypotheses just as if it were a geometrical system. The most important point, however, is that for Proclus the order of procession among divine realities can be traced by means of a mathematical model which seems to be adopted from Euclid.

At the beginning of the first prologue to his Euclid commentary, Proclus distinguishes mathematical being from the simplest partless realities, and from divisible things which are the most complex. After arguing for this ontological division, Proclus attributes it to Plato on the grounds that it corresponds to his distinction between different types of knowing. Thus intellect is held to correspond to indivisible realities because of their purity and freedom from matter. By contrast, opinion corresponds to divisible things in the lowest level of sensible natural objects; whereas understanding goes
[35] with intermediate things such as the forms studied by mathematics. While | marking it as inferior to intellect, Proclus argues that understanding is more perfect, more exact, and purer than opinion:

> For it traverses and unfolds the measureless content of *Nous* by making articulate its concentrated intellectual insight, and then gathers together again the things it has distinguished and refers them back to *Nous*.
>
> (*In Eucl.* 4.12–14, trans. Morrow)

In spite of appeals to Plato's authority and the use of familiar language from the *Philebus* (58–59), I think that here we have something unique to Proclus, namely, epistemological and ontological grounds for composing his *Elements of Theology* along Euclidean lines. The crucial point for this project is that (mathematical) understanding is a means by which the unitary content of intellect is reflected in a multiple form that makes it accessible to our discursive thinking. Although he insists that mathematical objects are multiform images which only imitate the uniform patterns of being, one suspects that Proclus finds them indispensable for obtaining access to the completely unitary objects of intellect. At least, this is a natural way to interpret the metaphor about mathematicals standing in the vestibule (ἐν προθύροις) of the primary forms, announcing their unitary and undivided and generative reality (*In Eucl.* 5.2–3).

My interpretation seems to be supported by Proclus' treatment of Limit and Unlimited both as mathematical principles and as principles of being as a whole. According to his *Elements of Theology* (89–90), these are the two highest principles after the indescribable and utterly incomprehensible One. By contrast with the One, which remains (μονή) always in itself without procession, these transcendent principles do give rise to an ordered procession

(πρόοδος) of things that appear in their appropriate divisions. Noetic objects, for instance, by virtue of their inherent simplicity, are the primary participants because their unity, identity, and stable existence are derived from the Limit, while their variety, fecundity, and otherness are drawn from the Unlimited (*ET* 90–92). While mathematical objects are also the offspring of the Limit and the Unlimited, Proclus emphasises (*In Eucl.* 6.7 ff.) that some secondary principles are involved in the generation of this intermediate order of things. Although he does not identify these principles, his examples suggest that they are principles in arithmetic and geometry which are seen as reflections of the primary principles of Limit and Unlimited. In the mathematical order of being, he says, there are ratios proceeding to infinity (reflecting the Unlimited) but controlled by the principle of the Limit. For instance, number is capable of being increased indefinitely, yet any number you choose is finite. Likewise, magnitudes are indefinitely divisible, yet the magnitudes distinguished from one another are all bounded, and the actual parts of the whole are limited. From these examples, I think it is clear that the Unlimited is reflected in the multiplicity of number and in the divisibility | [36]
of the continuum, both of which are controlled by some principle which reflects the Limit. Since mathematics presents such an accessible model for the characteristic activity of these principles, it is little wonder that Proclus finds it so indispensable for understanding how they function throughout the intelligible realm, which is the subject-matter of his theology.

But the most important evidence, of course, is Proclus' own explicit discussion (*In Eucl.* 21.25 ff.) of the contribution of mathematics to all branches of philosophy, and especially to theology. According to him, mathematics prepares the mind for theology by showing through images that apparently difficult and obscure truths about the gods are evident and irrefutable. For instance, it shows that numbers reflect the properties of transcendent beings (ὑπερουσίων), and it reveals the powers of the intellectual figures within the objects of the understanding. It is not at all clear what Proclus has in mind, even though he refers to Plato's many and wonderful teachings (δόγματα) about the gods by means of mathematical forms. This reference to some unwritten doctrines is not clarified in any way by the subsequent references to the secret theological teaching of the Pythagoreans, the so-called 'sacred discourse'[10] of Philolaus, and the treatise of Pythagoras on the gods. Apparently,

[10] Morrow 1970: 19n42 notes that this ἱερὸς λόγος is cited frequently by Iamblichus in his so-called *Life of Pythagoras*, by Syrianus in his commentary on Aristotle's *Metaphysics* (10.5, 123.2, 140.16, 175.6, Kroll), and by a contemporary of Proclus, Hierocles of Alexandria, in

all of these displayed the same tendency to clothe theology in mathematical garments, but we are not given any more information as to what precise form this took. In any case, given the Neopythagoreanism of Proclus himself, it is at least significant that he should cite these as precedents for his own approach to theology. It seems to indicate the general direction that he will take, though none of its details.

II. *Theology as Proclus' Systematic Science*

I propose to treat the *Elements of Theology* as a self-contained rational system about which one can ask internal and external systematic questions.[11] For instance, why does Proclus give primacy to the proposition (*ET* 1) that 'Every manifold in some way participates unity'? To begin an unhypothetical science, he needs something that is presupposed by every other proposition, but it is difficult to see how *ET* 1 fits the bill. Perhaps one clue is to be found in the sort of proof given, i.e. *reductio per impossibile*. Thus he supposes the
[37] opposite of the proposition to be the case, i.e. that there is a | manifold which in no way participates unity. Then he shows that, however one interprets this supposition, it leads to impossibilities. As a result, by indirect proof, he has established that every multitude in some way participates unity. The second proposition ('All that participates unity is both one and not one.') is proved in a straightforward way from the meaning of participation in unity, i.e. that something has unity as an effect and is not pure unity. So this something is one, in the sense of being affected by unity, but is also not one because the unity is by addition and not by itself.

The next logical step in the argument is represented by *ET* 3: 'All that becomes one does so by participation of unity.' The key point in this proof is that becoming one implies participation of unity, and so rules out the possibility that it is one absolutely. So this leads straight on to *ET* 4 ('All that is unified is other than the One itself') which is proved indirectly with the help of the previous two propositions (*ET* 2 & 3). Dominic O'Meara claims that Proclus regarded *ET* 4 as the first principle of his system, while treating

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his commentary on the *Carmen Aureum* (1.464 Mullach). Morrow speculates that these so-called 'sacred writings' may have been an invention of late Neopythagoreanism, though he does not doubt that Proclus takes them seriously.

[11] Lowry 1980 has adopted a similar approach to this work as a systematic treatise but he has completely ignored its mathematical dimensions, while also paying scant attention to the religious motivation for Proclus' system.

the previous propositions as part of the way to such a principle.[12] Whatever the case may be, *ET* 5 ('Every manifold is posterior to the One') shows some signs of an emerging system of priority and posteriority, with its important conclusion that there is a transcendent One which is also participated by every plurality. Subsequently (*ET* 6) he establishes the basic point that no plurality is indefinitely divisible but is composed either of unified groups or of units.

According to Dodds (1933: 3–7), the first six propositions deal with the One and the Many, which was a basic topic of Greek dialectic. From the systematic point of view, however, we can still ask why these propositions are chosen as primary for the subsequent development of the system. Perhaps the best way to answer this question is to explore the internal connections and dependencies of propositions within the whole system. For instance, there seems to be no good reason why the system should not begin with *ET* 7: 'Every productive cause is superior (κρεῖττον) to that which it produces.' As Dodds has pointed out, this is arguably the basic principle on which the whole structure of Neoplatonism is founded. The proof is similar to that given for *ET* 1 in that it works by the elimination of alternative possibilities and does not depend on any previous propositions. So why does Proclus not place it at the head of his system? The answer depends partly on the Greek tradition of dialectical inquiry and partly on Proclus' own system, in which the existence of the One is first established before its causative role is elaborated. I think that the One and the Many also reflect the principles of Limit and Unlimited, which come directly after the transcendent One.

But these connections are not established immediately, since the next [38]
proposition (*ET* 8) argues for the unity and transcendence of the Good or final cause. The argument depends on the self-evident (to the Greek mind) assumption that all things which exist desire the good. From this assumption it is argued that the primal good is beyond all such things because, if they desire the good, it is evident that none of them can be identical with it. In Procline jargon, if they 'participate' the Good then they cannot be the Good absolutely (ἁπλῶς), just as things which 'participate' the One cannot be identical with it. Here the guiding maxim accepted by Proclus (*Th. Pl.* II.7, 101) is the Plotinian one (III 8, 11; 9, 3; V 5, 13) that the addition of characteristics diminishes what is absolute. The basic notion is that what is

[12] D.J. O'Meara 1989: 204. He finds some vital evidence in the *Platonic Theology* II.66, 1–9 where Proclus identifies a thesis from Plato's *Parmenides* (137c: 'The One, if it is one, may not be many') as the very first concept of a science proceeding from the intellect.

simple, like absolute goodness, is made less perfect by any addition because that emphasises some aspect at the expense of others. Since Proclus realises that all definition involves some denial, he asserts that absolute goodness is indefinable and hence completely transcendent, thereby making a typical Neoplatonic transition from the logical to the metaphysical order of things.

Given the complete primacy of absolute goodness, the next two propositions (*ET* 9 & 10) establish the intermediate position of what is self-sufficient (τὸ αὔταρκες) between simple goodness and what is not self-sufficient. *ET* 9 states that everything which is self-sufficient, either in its existence or in its activity, is superior to what is not self-sufficient but rather dependent upon another existing thing as the cause of its completeness. It also notes that the self-sufficient has more likeness to the Good itself, though it is not itself the primal good because it participates good. This partly anticipates *ET* 10, which claims that everything which is self-sufficient is inferior to the unqualified Good. According to Proclus, the self-sufficient is that which has its good from and in itself, but that also implies that it participates good and so is not identical with the Good itself which transcends participation and fulfilment. These two propositions establish the self-sufficient as an Iamblichean 'mean term' between the unqualified Good and things which are good merely by participation. The self-sufficient resembles the Good itself in that its goodness is self-derived, and it resembles good things insofar as its goodness inheres in the not-good or the less-than-good. The assumption of Iamblichus (adopted by Proclus as a general rule) is that it would be impossible to bridge the gap between the Good itself and good things without something intermediate which shares some characteristics of each. It is such an assumption (based on the use of mean terms in mathematical proportion) which leads to the typical Neoplatonic multiplication of entities by filling up the intermediate spaces in a triadic fashion. This seems to be the logical ground for Proclus' introduction of henads between the One and the whole noetic realm, although he also has religious reasons for bringing them into his system. It would be quite consistent with the religious aspects of his Pythagoreanism to suggest that Proclus saw these henads as combining both the principles of Limit and Unlimited as actual and potential elements (*ET* 159). This is reflected at | lower levels in his system because he regards [39] all Being as a mixture or synthesis of Limit and Unlimited, just as Plato's *Philebus* had suggested.

In *ET* 13 systematic unity begins to emerge through the identification of the Good with the One. The argument (such as it is) is that, if unification is in itself good, and if all good tends to create unity, then the unqualified Good

and the unqualified One merge as a single principle which makes things both one and good. Apart from some intriguing terminology, the argument seems to provide no more than bald assertions of previous principles and conclusions. However, it does give a clear connection between two previous groups of propositions, which dealt with the One and the Many (*ET* 1–6) and with causes (*ET* 7–12), respectively. Although the One and the Good are not identified explicitly anywhere in Plato's dialogues, Dodds (199) thinks that Proclus is justified in representing this as Platonic doctrine, but I see it more as an illustration of the sort of creative misunderstanding involved in systematising an unsystematic tradition.

According to the plausible divisions supplied by Dodds, the next 11 propositions (*ET* 14–24) set out the Neoplatonic schema for a vertical stratification of reality. For instance, *ET* 14 classifies all things as either unmoved, or intrinsically moved or extrinsically moved. As Dodds rightly emphasises, this is not just a logical schema but also an ontological division of reality, which combines the Aristotelian unmoved mover with the Platonic self-moving mover, even though Aristotle's views seem to have developed in opposition to those of Plato. From the historical viewpoint, therefore, Proclus' *reductio* argument for the existence of an unmoved mover is worth examining. If we suppose all extrinsic movement to be derived from an agent, which is itself in motion, then we have either a circle of communicated motion or an infinite regress. But neither is possible, according to Proclus, because the sum of existence is limited by a first principle (*ET* 11), and the mover is superior to the moved (*ET* 7). So there must be something unmoved, which is the first mover.

One noteworthy point about the argument is Proclus' conception of the unmoved mover both as a productive and as a final cause, which gives the previous propositions about such causes an important role in the proof. An un-Aristotelian implication of this conception is that the unmoved mover is treated as the primary member in a chain of downward causation. Another example of creative synthesis by Proclus appears in his argument for the necessity of something self-moved as a link between the unmoved mover and the externally moved thing. Suppose that all things are at rest, what will be the first thing set in motion? By definition it cannot be the unmoved mover, nor can it be the externally moved thing, since its motion is communicated from outside. By elimination, therefore, the self-moved must be the first thing set in motion, as a kind of mean term (μέσον) between the unmoved mover and that which is extrinsically moved. Here we see the Iamblichean rule of mean terms used to fill up a perceived gap left by Aristotle's uncertainty over the place of self-moving souls in his cosmology.

[40] In connection with the development of the Procline system, the movement out from and back to the One is outlined in *ET* 25 to 39, which deal with the spiritual motions of procession and reversion. For example, *ET* 25 states that whatever is complete proceeds to generate those things which it is capable of producing, thereby imitating the one originative principle of the universe. The argument depends upon the assumption that this first principle, on account of its own goodness, is by a unitary act constitutive of all that is, since the Good is identical with the One (*ET* 13) and action under the form of goodness is identical with unitary action. In a similar way, principles inferior to the One are impelled by their own completeness to generate further principles inferior to their own being (*ET* 7). The reason for such impulsion is that the Good is constitutive of all things (*ET* 12), and so whatever is complete is by nature productive within the limits of its power. Here there is a direct connection between degrees of reality and of productiveness in the following way. The more complete is the cause of more, in proportion to the degree of its completeness, since the more complete participates the Good more fully, i.e. it is nearer to the Good or is more akin to the cause of all. The basic rule of this hierarchy is that whatever constitutes a larger class of things comes nearest to the universal performance of these functions, while a like service to a smaller class stands at a further remove. The explicit corollary of this rule is that the principle most remote from the beginning of all things is sterile and a cause of nothing. Proclus seems to be referring here to unitary and primary matter, which stands sterile at the lowest point in the system whose highest point is the fruitful One.[13] Dodds (212) reads this proposition as a formal statement of the Plotinian law of emanation, whose implicit panzoism is extended to the hierarchy of cosmic principles. But it is also possible to read the proposition as an expression of a Neoplatonic principle of plenitude which is connected exclusively with form and not with any potency of Aristotelian matter.[14]

In fact, Proclus insists upon the inseparability of the similarity and difference between the cause and its immediate product in every procession. Such insistence conforms to the 'mean term' rule and also lays the foundations for the opposite movement of reversion in which whatever has proceeded also reverts in respect of its being upon that from which it proceeds (*ET* 31). Just

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[13] This gives the misleading impression that Proclus' hierarchy is linear, whereas, in fact, it is circular in character; so that (paradoxically) unitary matter is in a certain way nearest to the One.

[14] This is similar to A.C. Lloyd's interpretation (1990: 106 ff.) of what he calls 'the Proclan rule' as an aversion from dualism.

as the One is the ultimate principle of procession, the Good is the principle of reversion because all things seek to attain the Good through their own proximate causes. Such a cause is the source of well-being for each thing and is also the primary object of its desire. Thus, according to Proclus (*ET* 32), all reversion is achieved through some likeness between the reverting terms and the goal of reversion. This gives rise to a cycle of procession and reversion | between the principle and that which it produces (*ET* 33), by [41] virtue of the natural sympathy between the two. Whatever reverts by nature is said to have desire in respect of its being for that upon which it reverts. We see here the basis for natural magic in the Procline system, since likeness is the principle on which theurgy depends for its theoretical possibility. A corollary of *ET* 34 is that all things proceed from Intelligence (νοῦς), since it is an object of desire to all things. Thus, according to Proclus, it is from Intelligence that the whole world-order is derived, even though it is eternal. This represents his attempt to reconcile Plato's talk of the 'generation' of a cosmos in the *Timaeus* with the Academic tradition that the world-order is eternal. Since the procession is logical rather than temporal, Intelligence can proceed eternally and be eternally reverted, while still remaining steadfast in its own place in the cosmos.

However, the tidiness of the Procline system appears to be upset somewhat by the introduction (*ET* 40) of things called 'self-constituted' (αὐθυπόστατα) which get their substance from themselves, as distinct from things that proceed from another cause. At first sight it seems that such entities can find no place in the continuous system of procession and reversion to a first principle that functions as both formal-efficient and as final cause. Furthermore, one wonders why Proclus felt it necessary to introduce such entities into his neat monistic system. By way of answer, Dodds (224) suggests that he is trying to make some provision for the freedom of the human will, which was a necessary ethical postulate in Hellenistic philosophy. He argues that the concept of 'self-constituted' here does not mean 'self-caused' in the sense of being an independent principle, but rather it 'hypostatises itself' or determines the particular potentiality that will be actualised in it. But Whittaker (1974: 193–230) has cast doubt upon Dodds' historical account, which also fails to explain the role of self-constituted things in the whole deductive system. Thus, I think one must seek an alternative answer by way of comparison with the place of henads as the highest self-constituted entities.

In *ET* 40 the argument for self-constituted entities depends heavily on an earlier proposition (*ET* 9) that whatever is self-sufficient, either with respect to being or to activity, is superior to anything that is dependent on another as the cause of its completeness. It is not a big step to the conclusion that

things which are produced by themselves or are self-constituted are senior (πρεσβύτερα) to those things which derive their being solely from another. Yet the *reductio* argument by exhaustion repays scrutiny. Proclus outlines three possibilities: either there is nothing self-constituted, or the Good is such a thing, or else the principles which arise first from the Good are such things. It is through his rejection of the first possibility that we get the clearest view of the necessity of self-constituted things in his system. If there are no such
[42] things, he argues, then there will be no true self-sufficiency in | anything, neither in the Good nor in things posterior to the Good. Since such a lacuna is unacceptable, it remains to decide whether the Good itself is self-constituted or only things posterior to the Good. But he argues that the Good cannot be self-constituted because it would thereby lose its unity in producing itself, since that which proceeds from the One is not-One. So he concludes that self-constituted things must exist as posterior to the first principle but as prior to things that depend completely on another cause.

This whole argument establishes the intermediate place of self-constituted things in the Neoplatonic hierarchy between the transcendent first principle and lower entities that have only external causes. In *ET* 41 these latter are distinguished from self-constituted entities in terms of what has its existence 'in another', as distinct from what exists 'in itself'. Here the self-constituted is identified with that which can exist in its own right without inhering in a substrate, just as soul can exist without body, and intelligence without soul. These parallels are reinforced by *ET* 42 and 43 which state that whatever is self-constituted is capable of reversion upon itself and vice versa. I think we can take Proclus to be referring to the capacity for self-reflection which is a characteristic function of the higher faculties of the soul.

But Proclus also argues (*ET* 44) from their self-reflective activity to the independent existence of self-constituted things. As Dodds (225) points out, this is an essential step for the proof of the immortality of self-constituted entities, which he gives in the subsequent propositions (*ET* 45–51). In *ET* 45, for instance, he argues that they are without temporal origin because everything having such an origin is in itself incomplete and needs the perfective activity of something external. By contrast, whatever produces itself is perpetually complete, since it is always immanent in its cause as the principle that perfects its being. The corollary of this (*ET* 46) is that everything self-constituted is also imperishable because a condition of perishability is that something can be separated from its cause. If we assume that having parts or being complex is another such condition, then the imperishability of self-constituted things is also supported by the proposition (*ET*, 47) which establishes that they are simple, i.e. without parts. Such a conclusion is

confirmed by *ET* 48 which claims that whatever is not perpetual is either composite or has its subsistence in another, while *ET* 49 holds that whatever is self-constituted is perpetual. Finally, *ET* 50 and 51 together establish that whatever is self-constituted transcends the things that are measured by time with respect to their existence. Dodds (227) claims that Proclus here introduces the distinction between temporal existence and temporal activity in order to allow the human soul to engage in such activity, even though it has immortal existence as a self-constituted entity (*ET* 191).

With reference to Proclus' own philosophical and spiritual motivation for system-building, however, perhaps the most illuminating problems arise from his introduction of henads as independent entities between the transcendent One and the whole noetic realm. The difficulties associated with these entities | have already been well discussed by Dodds (257–260) and Beutler [43]
(1957: 186–247), so that I can focus my questions on their function in his system. It is clear that their introduction is motivated by Proclus' desire to give the traditional gods a leading role in his system of theology, even though Homer's lusty anthropomorphic figures become metaphysical abstractions in the process. Yet I think that this transformation, which Dodds (260) regards as 'one of time's strangest ironies', is precisely what Proclus needs in order to justify theurgy as a religious practice. If the henad which stands at the head of each hierarchical series has 'processed' in continuous steps to the lowest intelligible things, then it is possible to return to the deity by retracing these steps. Such a return corresponds to what Plotinus had already spoken about in terms of mystical union with the One, without providing any theoretical or practical guidance on how it might be achieved. Even though Proclus takes the One to be completely unknowable and inaccessible, the positing of henads seems intended to supply intermediaries by means of which divine power can be exercised and recognised. This move also has important implications for divine providence, about which Proclus wrote at least two treatises: *de providentia et fato*, and *de decem dubitationibus circa providentiam*.[15]

In contrast to the earlier Greek religious tradition (which belongs mainly to the poets), it is noteworthy that Proclus feels obliged to give a formal deductive proof (*ET* 113) of polytheism. Along with being an argument against Christian monotheism, this represents a solution to the Plotinian problem of bridging the gap between the transcendent One and the rest of reality by appealing to the Iamblichean rule of mean terms. But perhaps the most

[15] Proclus 1960: 3–108, 109–171.

problematic proposition (*ET* 114) is that every god is a self-complete henad and, conversely, that every self-complete thing is a god. The longstanding difficulty here is how the gods can be self-complete (αὐτοτελής) if they owe their divine character to participation in the One. Similar difficulties have already been raised about the 'self-sufficient' and 'self-constituted' things, which do not fit comfortably into a hierarchical causal series that begins with the One. The problem is merely compounded by the subsequent proposition (*ET* 115) which claims that, as a self-complete henad, every god is above Being, Life, and Intelligence. Although Proclus sometimes uses the tenn 'gods' more generally and loosely, he posits henads (i.e. gods in the strict sense) as transcending the three Plotinian hypostases. This indicates, I think, that he is using the henads to bridge the gap which Plotinus left between One and the rest of reality. But, as Dodds (261) points out, such a metaphysical doctrine can only be squared with traditional theology by a rather artificial use of the principle that everything is in everything but appropriately (οἰκείως) in each. However, the very fact that Proclus makes such efforts to insert the traditional cult gods into his system shows that
[44] religious | theory and practice were important motives for composing the *Elements of Theology*.

This intermediary role of the henads becomes clearer with the proposition (*ET* 116) that every god is participable, except the One which transcends all participation. Since the henads are self-complete unities that are most like the One, they are most closely linked to it but not by participation. However, they themselves are linked to lower unities by participation, and so a henad will stand at the head of each order (συστοιχία) which proceeds downward by participation. This is another way of understanding the proposition (*ET* 117) that every god is a measure of things existent. The claim is that, since each henad has the character of unity, it defines and measures all the manifolds of existents (οὐσίαι). Proclus' proof also appeals to his very first proposition (*ET* 1) that manifolds are essentially indeterminate and so require unity for their determination. But, consistent with the Procline division of reality, it is the manifolds of existents (ὄντα) that are measured by the henads, while the Forms serve as measures for the manifolds of generated things (γιγνόμενα). Here the systematic principles of Limit and Unlimited in Proclus' thinking about the divine are reflected throughout the system, thereby providing further theoretical foundations for the theory and practice of theurgy.

Finally, let me consider briefly those propositions (*ET* 119–124) that bear directly or indirectly on the question of divine providence. The foundation is laid with the claim (*ET* 119) that every god *is* (as distinct from having) supra-existential (ὑπερουσίως) excellence. It follows (*ET* 120) that every god has

the essential function of exercising providence towards the universe, i.e. the bestowal of good things upon the secondary existences which thereby convey the good to all things. By way of evidence for providence as an appropriate activity of the divine, Proclus points out that the term 'providence' (πρόνοια) itself refers to an activity prior to Intelligence (πρὸ νοῦ). While we may regard this as mere word-play, it is typical of the Platonic tradition to search for evidence in the wisdom of language. For Proclus, the term 'providence' itself indicates that it belongs appropriately to the henads which he places beyond Intelligence in his own system, by way of opposition to Plotinus. In order to safeguard the transcendence of the gods Proclus emphasises that they maintain their substantial unity, even while exercising providence towards secondary existences. Thus the gods are in no danger of becoming busybodies, since their goodness shines on everything like the light of the sun and each thing partakes in their providence according to its own limited capacity. In contrast to the one-sidedness of Aristotle and the Stoics, Proclus triumphantly reconciles providence with the transcendence of the gods through his system of procession and reversion.

III. *Philosophy as Hegel's Systematic Science*

I find it significant that Hegel resisted the defamation of Proclus as a religious zealot (*Schwärmerei*) by contemporary historians of philosophy like Brucker | [45]
(1742), Tiedemann (1793) and Tenneman (1807). Clearly, this revaluation of Neoplatonism played an important role in his own view of history as the development of Absolute Spirit found in art, religion, and philosophy. Thus it is understandable that Hegel should read the history of philosophy as more ordered and rational than perhaps it was in fact. Though he acknowledges that there may have been contradictions (i.e. reverses) at the particular levels, he insists that they are 'taken up' (*aufgehoben*) within the truth of the whole. This has the rather paradoxical result that the history of philosophy is no longer history in our usual sense, but rather an idealised retrospective on the development of Absolute Spirit from the point of view of principles and ideas which reflect the manifestation of Spirit in Hegel's own time. If we view such self-centredness (which Aristotle also displays) in philosophers as typical of their hermeneutical situation, we may find some truth in Hegel's schematic reconstruction of history. In such an idealised history, Plato is treated as the discoverer of speculative Dialectic because he recognised the identity in difference of being and non-being, one and many. Aristotle is also very important as the first thinker to grasp the concept of pure actuality

through his notion of the divine as 'thought thinking itself'. This is taken to be an anticipation of Hegel's own notion of self-conscious Reason.[16]

But Hegel's greatest praise is reserved for Proclus, because he introduced triadic thinking into his theology. He is praised especially for not dealing with the triad as three abstract parts but rather as one concrete totality which retains and fulfils all three determinations. For Hegel the crucial conceptual advance is that the internal differentiations of the Idea are retained in the whole. Thus he regards Proclus as the leading thinker among the Neoplatonists, and as more advanced than Plotinus (*Vorlesungen* § 473). This passage helps to clarify Hegel's admiration for Proclus, though even more remarkable is his interpretation of the mystical tendencies in Neoplatonic philosophy as speculative thinking (§ 484). Such an interpretation of Proclus is undoubtedly influenced by Hegel's own conception of religion as an aspect of Absolute Spirit which is brought to its conceptual fulfilment through philosophy. Hegel's *Logic* outlines the way in which Spirit moves from an abstract and empty universal toward a concrete universal that is in-itself and for-itself. The traditional distinction between form and content is supposedly overcome in this logic, whose function is to follow the inner movement toward the truth of the whole (cf. *Logic* I, § 31; II, § 356).

In his Introduction to the *Logic*, which is the first part of Hegel's *Encyclopaedia of the Philosophical Sciences*, we find ample evidence for the religious motivation behind his own philosophical system, when he identifies Truth or God as the common object of philosophy and religion. Hegel also
[46] cites the | anthropological evidence for a distinction between mankind and the lower animals in terms of a capacity for religion and philosophy. Furthermore he claims (§ 6) that the content of philosophy is Actuality understood as the core of truth for the world of consciousness, both inward and outward. Since philosophy is different only in form from other modes of becoming acquainted with the same reality, it must be in harmony with experience, which may even serve as an extrinsic means of testing the truth of a philosophy. But, according to Hegel, the highest and final aim of philosophic science is to bring about a reconciliation of self-conscious reason with the Reason which is in the world, i.e. Actuality. On this basis he defends the controversial propositions contained in the preface to his *Philosophy of Law*, namely, that what is reasonable is actual, and that what is actual is reasonable. Behind

[16] Gadamer has shown that this is a misunderstanding on Hegel's part, just as is his interpretation of Plato's *Sophist*, though these are good examples of 'creative' misunderstanding; cf. H.-G. Gadamer, 1976, ch. 1.

this stands his religious belief in divine government for the world, whose philosophical meaning is that God is the supreme and only true Actuality. In the *Logic* Hegel distinguishes Actuality not only from the fortuitous, but also from the categories of existence and other modifications of being. Indeed, his thesis about the actuality of the rational involves a rejection of the traditional distinctions between idea and reality, and between 'is' and 'ought'. For him philosophy is about an Idea or Actuality whose phenomenal aspects are represented by external objects and social conditions.

However, Hegel also acknowledges the right of the empirical sciences to be called philosophical, and he even accepts as a principle that one must be in touch with their subject-matters, either through the external senses or through our intimate self-consciousness. Although these sciences begin with experience, he argues that their aim is to provide general propositions about what exists and that it is this feature which makes them philosophical. Yet, according to him, such empirical knowledge cannot deal with objects like freedom, spirit, and God, whose scope and content is infinite. This shortcoming requires one to move to the higher viewpoint of speculative philosophy which assumes that Mind or Spirit is the cause of the world, and this means that morality and religion can arise from and rest upon thought alone. Furthermore, the demand of subjective reason for necessity is not satisfied by the empirical sciences because of two defects of method, namely, that the universal propositions are not connected with particulars, and that their principles are postulates which are neither accounted for nor deduced. When reflection tries to remedy these defects it becomes the sort of speculative thinking that belongs to philosophy.

Yet Hegel emphasises that such a speculative science does not neglect the positive sciences, but rather appropriates for its own structure their universal laws and classifications. In addition, however, it introduces other categories that are commensurate with the concepts typical of philosophical thought. Thus, for instance, speculative logic contains all previous logic and metaphysics by preserving the same forms of thought, while expanding into wider categories. Hegel recognises (§ 10) the need to defend his rather
[47] extravagant | claims that speculative philosophy is able to apprehend absolute objects like God, spirit, and freedom; though he thinks that such a defence is best given through his own practice of this science. Against Kant's prohibition on metaphysics, Hegel objects that the proposed critical examination of knowledge itself involves the sort of speculative dialectic that he himself uses in the philosophical science. Hence, in spite of what Kant says, philosophy must be continued so as to satisfy a craving in the most inward life of the mind, which expresses itself in thinking. Due to the narrowness of

understanding, mind entangles itself in contradictions and stimulates the craving of reason to work out the solutions in itself. But, in order to overcome these contradictions, mind must rise above the dialectical to the speculative mode of thinking (§ 80–82).

Thus Hegel attributes the perennial character of philosophy to this craving for thought in the human mind. While it begins with experience, its antagonism to sense phenomena leads it to the Idea of the universal essence of these phenomena. Even the empirical sciences stimulate the mind to overcome the form in which their varied contents are presented and to elevate these contents into necessary truths. While incorporating the contents of the empirical sciences, philosophy makes such contents imitate the action of the original creative Thought and the evolution of the Absolute. Therefore, contrary to what his many critics say, Hegel does hold experience to be the real author of growth and advance in philosophy. According to him, philosophy owes its development to the empirical sciences, though it adds the *a priori* character that constitutes the freedom of thought in itself. The empirical contents are now warranted as necessary and no longer dependent on the evidence of facts, which themselves become illustrations and copies of the original and self-sufficient activity of thought. Incidentally, this view about the higher role of philosophy throws a different light on Hegel's *Dissertation*, where he tries to establish the necessity of Newton's laws of planetary motion.

Hegel also claims (§ 13) to have some insight into the inner necessity of the origin and development of philosophy, which is reflected externally in the history of philosophy. From the historical point of view, the stages in the evolution of the Idea seem to follow each other by accident, but Hegel thinks that this cannot be the case because the Architect directing the work is the one living Mind, whose nature is to think and to bring its own essence to self-consciousness. For him the latest development in philosophy is the result of all the preceding systems, and so must include their principles. Thus philosophy will be the fullest, most comprehensive, and most adequate system of all. Here we can see the philosophical and religious motivations that lie behind Hegel's interest in system as an expression of the Absolute.[17]

[17] In Hegel's Doctrine of Essence, § 112 & 159, we find more evidence for the religious motivation behind his philosophy, when he insists that the absolutely infinite God is identical with the inner essence of things, and so should not be treated as some supreme other-worldly being. See also his discussion of the compatibility of necessity and providence within the divine as Actuality, § 147–149.

He is particularly insistent that the system of philosophy, whose principle [48]
is universal, cannot be put on the same level with any other system whose principle is particular. The same evolution of thought that is presented externally in the history of philosophy is also presented in the system of philosophy itself within its own internal medium of thought. Thinking which is genuine and self-supporting must be intrinsically concrete, and when it is viewed in its universality, it is the Idea or the Absolute. For Hegel the science of this Idea must form a system because truth is only possible as a universe or totality of thought. Thus philosophy cannot be a scientific production unless it forms a system whose universal principle is to include every particular principle. Due to its encyclopaedic character, philosophy does not give a detailed exposition of particulars but rather outlines the principles of the special sciences and the notions of chief importance in each. But, unlike ordinary encyclopaedias which present bits of knowledge in a wholly extrinsic arrangement, the encyclopaedia of philosophy must form a system because it presents the necessary internal relationships between its constituent parts (i.e. Logic, Philosophy of Nature, Philosophy of Mind). By contrast with the positive sciences, which lack necessity and fail to ground their assumptions properly, philosophy can examine its own presuppositions dialectically and establish their necessity. In this way philosophy reaches the closure required of a complete system, like a circular line that returns to its origin.

The first part of this philosophical system is logic, which is the science of the pure Idea in the abstract medium of thought, taken as a self-developing totality of its laws. For Hegel (§ 19) God as absolute truth is the object of logic, which is the only mode of grasping the eternal and the absolute. Thus the general topic of logic is the supersensible world, by contrast with mathematics which deals with the abstractions of space and time. Hegel takes Aristotle to be the founder of logic as a purely formal treatment of the laws of thought, but he himself wishes to go beyond this view of logic as purely instrumental. For him (§ 24) logic coincides with metaphysics, as the science of things set and held in thoughts that express the essential reality of things. This identification is based on Hegel's explicit assumption (§ 23) that the true nature of reality is brought to light in reflection, which is the activity of a thinking subject. Contrary to Kant's thesis about an unknowable thing-in-itself, Hegel claims that the objective world in its own self is the same as it is in thought. For him objective thought is the heart and soul of the world or, as the ancients would say, νοῦς governs the world. Reason is in the world as its principle, since its inward nature is universal. Thus Thought (as universal) is the constitutive substance of external things, and it is also the

universal substance of what is spiritual. Hegel's absolute idealism is grounded in the assumption that Thought is the basis of everything because it is the true universal in all that nature and mind contains. Since Logic is the system of pure types of thought, Philosophy of Nature and of Mind are types of
[49] applied logic, since they represent particular modes of expressing the | forms of pure thought. This is why the rationality of the real can be expressed in a philosophical system.

Conclusion

Taking Proclus and Hegel as leading examples of systematic thinking, I have argued that religion provides one of the deep motivations for the construction of systems in philosophy. Since these two illustrate pagan and Christian thinking, respectively, it is obvious here that 'religion' must be taken in a very general sense, i.e. a belief in the divine governance of the world. This divine power is typically identified as an intelligent and ordering force, so that it is usually assumed that Intelligence rules the world and creates a rational world-order. Therefore, if one wishes to understand this intelligible cosmos, it follows that one must construct a rational system that reflects the ordering principles of intelligence. However, as we have seen in Proclus and Hegel, there may be different conceptions of what constitutes a rational system, i.e. mathematics or speculative dialectic.

PLATO'S *PHILEBUS* AS A GADAMERIAN CONVERSATION?

Introduction

There is a very old tradition[1] that places Plato's dialogues within an existing genre of literary works which were generically called 'Socratic conversations', so there is a prima facie case for regarding them as real conversations rather than as monological treatises. In support of this approach, one might cite the grammatical fact that the Greek verb for dialogue (*dialegesthai*) refers to a conversation between two or more partners. Most crucially, Plato's *Theaetetus* (189e) gives an account of thinking in terms of an internal dialogue of the soul with itself. Thus it would appear to be undeniable that Plato's dialogues should be read as conversations, but yet it remains an open question in every case as to what kind of conversation is involved. In this paper I want to explore the suggestion that a useful hermeneutical model for reading the *Philebus* dialogue might be provided by Gadamer's notion of conversation.

But what difference does it make for extracting the philosophical content of a dialogue like the *Philebus*, whether it be read as a monologue or as a conversation? Ever since Aristotle drew on the Platonic dialogues to expound the philosophical views of Socrates or of Plato himself, there has existed a well-established tradition of treating them as vehicles for philosophical doctrines. This is the tradition which is presumably being followed by those modern scholars[2] who focus primarily on Plato's argument, while paying little or no attention to the literary form of the dialogue or to the character of the interlocutors. Indeed, such an analytical approach makes a great deal of sense if one is mainly interested in identifying the philosophical views or 'positions' of Plato vis-à-vis his predecessors or successors.

However, even within the Anglo-American tradition of Plato scholarship, the question of why he chose to write dialogues rather than philosophical

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[1] Aristotle credits Alexamenos of Teos with being the originator of the literary genre of *Sokratikoi logoi* or 'Conversations with Socrates'. See Aristotle, *Poetics* 1447b11, *De Poetis*, fr. 3 Ross.

[2] I have in mind scholars like Gregory Vlastos (1981) and Terence Irwin (1977a). In response to criticisms from David Roochnik, Irwin's (1988: 195, 198) defence of his interpretive approach to Plato is based on the claim that it can be traced back to Aristotle, whom he regards as a good historical source for the philosophical views of Socrates and Plato.

treatises has recently attracted significantly more attention.[3] A number of leading scholars have addressed this issue and have provided different interpretive hypotheses by way of answer. For instance, Michael Frede (1996) has suggested that Plato did not want to lay claim to the sort of authority associated with a treatise, even though that might have provided a more suitable format for the subject-matter of the *Sophist* and *Statesman* dialogues. But Frede's suggestion seems to imply that Plato would have espoused a monological approach to philosophical activity if he had wanted to speak with authority, though he actually adopted a dialogical approach because he followed the Socratic example of disclaiming dogmatic knowledge. Therefore, my strategy in this paper involves comparing the attitude towards Platonic dialogues of scholars like Michael Frede with that of Gadamer, who takes philosophical activity to be essentially dialogical.

In the specific case of reading Plato's *Philebus*, one might formulate the problem rather pointedly as follows: What does Gadamer's emphasis on dialogue as coming to an understanding add to the interpretation of the *Philebus* that cannot otherwise be provided by a (mono-)logical analysis of the arguments? For those people who are simply interested in giving such a logical analysis of Plato's views, the conversation between Socrates and Protarchus does not appear to be important in itself, except insofar as it advances the argument that Plato wants to make primarily through Socrates as his mouthpiece. In fact, one might claim that it is not really a conversation between equals, since Socrates must shoulder the responsibility for leading a rather helpless Protarchus towards shared agreement. Along these lines Donald Davidson (1977: 424) has objected that Gadamer fails to underline how seldom Socratic conversation appears to result in shared understanding within Plato's writings. However, Davidson also accepts Gadamer's claim that the *Philebus*, more than any other of Plato's late works, both illustrates and describes how we come to a shared understanding. Yet Davidson still thinks that the Platonic dialogues fall short of the ideal of a communal search for understanding because of the asymmetry between Socrates and his interlocutors, and because of Plato's implicit assumption that there is a fixed and definite answer to the deep moral questions being asked. The latter rationale brings up the issue of whether truth is objective for Plato, rather than intersubjective, as Gadamer's model of conversation seems to imply.

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[3] C. Gill & M.M. McCabe (1996).

With specific reference to such debates among modern Plato interpreters, I want to explore the implications of Gadamer's distinction between Plato as the dialectician and Aristotle as the philosopher of the concept. If the distinction is legitimate, does it condemn all interpreters of Plato to the fate of Aristotle, who (according to Gadamer) projects onto one dimension the multidimensional phenomenon that is Plato's dialectical philosophy? This puzzle is compounded by Gadamer himself (1997: 38) when he concedes that Aristotle always wins the argument with Plato on the conceptual level, although he does so only by closing down the open-ended features of Plato's philosophical activity. So how should Plato scholars proceed when interpreting a Platonic dialogue? If one adopts the analytical approach, then one will focus primarily on its propositional claims, while paying attention to the literary features only insofar as they advance the argument. But, according to Gadamer, that approach involves the sort of conceptual flattening associated with Aristotle's interpretation of Plato. Yet what is the alternative sort of interpretation offered by Gadamer? This is what I intend to explore here, while raising doubts about whether Gadamer himself manages to avoid Aristotelian one-dimensionality in his interpretation of Plato's *Philebus*, given his emphasis upon the unity of effects within the Platonic-Aristotelian philosophy of the logos (1991: 7).

I. *The Link between Demonstration and Conversation*

When one reads Gadamer's first published work (1931), whose second part provided a general commentary on Plato's *Philebus*, one is struck very forcibly by the Heideggerian influence that is reflected both in its language and its philosophical approach. Given this obvious fact about Gadamer's intellectual biography, one might assume that he subsequently emerged out of Heidegger's shadow when he developed his own hermeneutical approach to Platonic texts that was much more subtle philologically. However, in his preface to the Second Edition of *Plato's Dialectical Ethics* (1967), Gadamer reaffirms his original intention of applying the art of phenomenological description, which he had learned from Heidegger, to a Platonic dialogue. Gadamer's interpretation of Plato focuses on the harmony of *logos* and *ergon* in the dialogues, as the essence of Platonic philosophising. The Preface to the 1982 reprint lists two things that the book still has to teach: (1) that phenomenology is not so much something that one talks about, as it is a practice or skill to be acquired; (2) that in dealing with philosophical texts one may never dispense with hermeneutical reflection, which enables one

to hear what is said in different forms of philosophical talk, e.g. dialogue and dialectic, mythos and logos, the art of dramatisation, and the work of the concept.

For my purposes here, Gadamer's most important philosophical theme is the emphasis on language as the ground of being human. His basic claim is that thought itself depends on language whose original manifestation is in conversation. So for him it is only through interpersonal communication that there can emerge an objective or shared world. Not only is it the case that the aim of conversation is 'shared understanding', but also without sharing there is no understanding. For Gadamer speech in its primordial form constitutes part of a shared engagement with something. Language is not the exclusive possession of any one individual, since every conversation presupposes a common language about a shared subject-matter. In any successful conversation both partners to a dialogue come under the influence of the truth of the matter, and so are bound to each other in a new community. Thus to reach an understanding with one's partner in a dialogue involves transformation into a community in which everyone involved is changed.[4] Taken at face value, such claims seem to suggest that Gadamer adopts an intersubjectivist rather than objectivist conception of truth.

According to Jean Grondin,[5] the key insight for Gadamer's appropriation of Plato's dialogues is that every proposition is artificially separated from the dialogue through which language lives. From Augustine, Gadamer learned that the meaning which language mediates is not the abstractable logical meaning of the proposition but rather the interweaving (*Verflechtung*) that occurs in it. The 'logical' concentration on what is asserted abstracts from the 'answer-character' of the word, or from its reference to a prior question. The true universality of language lies in this dialectic of question-and-answer out of which a truly philosophical, or universal, understanding can unfold. This is the 'hermeneutical ur-phenomenon', according to Gadamer (1991: 7), i.e. the most original insight of hermeneutics is that every assertion must be understood as an answer to a question.

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[4] H.-G. Gadamer (1997: 22): 'The "use" of words in a language is not a "using" at all. Rather language is a medium, an element. Language is the element in which we live, as fishes live in water. In linguistic interaction we call it a conversation. We search for words and they come to us; and they either reach the other person or fail him. In the exchange of words, the thing meant becomes more and more present. A language is truly a "natural language" when it binds us together in this way.'

[5] Jean Grondin (1995), ch. 7, 'Gadamer and Augustine: On the Origins of the Hermeneutic Claim to Universality'.

While adopting Heidegger's opposition to the logic of the proposition, Gadamer also developed his own dialogical hermeneutics whose chief maxim was: 'Language accomplishes itself not in propositions, but in dialogue.' Such a hermeneutics insists that a proposition cannot free itself from the dialogue in which it is embedded, and from which it obtains its meaning. In effect, the proposition itself is a mere abstraction that one never encounters directly in the life of a language. Against the primacy of propositional logic, which conceives of understanding as some sort of (methodical) control, Gadamer proposes the hermeneutical logic of question and answer, which conceives of understanding as participation in dialogue where, instead of propositions, there are questions and answers that in their turn elicit new questions. In summary, Gadamer holds that the question is the ultimate logical form of motivation for every proposition.

Gadamer notes, however, that there are wide differences between Aristotle's monological conception of science as demonstrative knowledge, and Plato's dialogical conception of knowledge as what can be discovered only through cooperative inquiry. In the first case, the achievement of knowledge does not depend on the agreement of others, whereas in the second case the agreement of one's conversation partner is essential for coming to an understanding, which is the goal of dialectic.[6] Yet Gadamer tries to reconcile such differences by claiming that Aristotelian *epistêmê* developed historically out of Platonic dialectic. In order to support this claim, he interprets the beginning of Aristotle's *Metaphysics* in terms of the Heideggerian analysis of Dasein's comportment towards its world as 'care', which involves both practical and theoretical dimensions.

According to this analysis, the unique capacity of human Dasein for *technê* and *logismos* reveals a tendency towards knowledge as a mode of Dasein's

[6] H.-G. Gadamer (1976: 24): 'So one has to say that the first philosophical texts of the Greeks that we possess are the Platonic dialogues and the so-called "teaching treatises" (*Lehrschriften*) of Aristotle. Both of these texts, of course, immediately confront us with the fundamental hermeneutical problem of writtenness (*Schriftlichkeit*). Plato's dialogues are conversations written down by a great philosophical and poetic master, and yet we know from Plato himself in his famous "Seventh Letter" that he did not leave behind a written presentation of his true teaching and did not want to. This means he has unequivocally confronted us with the necessity of a mimetic doubling, that is to say, by means of the written conversation to go back to the original spoken conversation in which the thought found words—a task that can never be fully accomplished. Now certainly one can see quite well through the eyes of Aristotle what had been thought in this conversation. But once again one sees this only in the further mediation of reading a trace of Aristotle's spoken speech in the so-called "texts" of the Aristotelian corpus that have been left behind.'

care, independent of its ability to perform everyday tasks. In Aristotle's terms, the person with *technê* not only knows what is the case, but also why it is the case. In Heidegger's terms, *technê* represents a new mode of Dasein's care because it includes the certainty of its disposition over the world, which is characterised by knowledge of the reason or cause. But the really scientific concept of being arises within the primary horizon of production through *technê* when it leads to *theoria*, i.e. knowledge of the world based on reasons or causes of its being. According to Gadamer, therefore, the primary sense of *logos* consists in being answerable, i.e. giving an account in terms of reasons or causes. Thus Dasein's mode of comportment towards an object of knowledge necessarily involves the claim that it is communicable, and hence intelligible to other people. In this way, Gadamer tries to bridge the apparent gap between Plato's dialectic and Aristotle's monological science. Using as its guide the function of the other person in our speaking with one another, his analysis tries to clarify how scientific talk is carried out as a means to coming to a shared understanding about reality, so as to grasp more precisely the structure of scientific assertions, i.e. of assertions that give reasons or causes.

Gadamer asserts (1991: 35) that, in itself, all speaking has the character of 'speaking with someone' which intends that what it speaks about should be understood as the kind of thing that the speech makes it visible *as*—this is a specific claim to understandability.[7] But the *logos* of science makes an additional, specific claim to understandability and to a corresponding response, a claim that makes up the speech's characteristic way of relating to the facts of the matter. A scientific statement does not simply assert that a state of affairs exists but exhibits it as necessary for a reason. The inherent claim to necessity also involves a claim to evidentness (*Einsichtigkeit*) which assumes the other person's agreement, purely as something that follows from his going along with the reasoned presentation of the previously discovered reality. So, when there is agreement, the fulfilment of the claim to evidentness means that the reason-giving account is reflected back to the speaker by

[7] H.-G. Gadamer (1976: 36): 'For this reason every dialogue we have with the thinking of a thinker we are seeking to understand remains an endless conversation. It is a real conversation, a conversation in which we seek to find "our" language—to grasp what we have in common. Consciously taking up a historical distance from one's partner and placing the partner in an historically surveyable course of events must remain subordinate movements of our effort to achieve understanding. As a matter of fact they represent a self-assurance by which one actually closes oneself off from one's partner. In a conversation, on the other hand, one seeks to open oneself to him or her, which means holding fast to the common subject-matter as the ground on which one stands together with one's partner.'

the other person and thereby confirmed in its claim. Both speech and contradiction, as scientific actions, are subject to the same guiding idea of concern for the facts of the matter, which gives their claim to necessity and evidentness its character.

The point of Gadamer's characterisation of the structure of scientific speech and its degenerate forms is to establish the historical horizon within which to situate the Socratic dialogue and hence the origins of Plato's dialectic. In a conversation with Socrates, the genuineness of the interlocutor's claim to knowledge is put to the test by this demand for accountability. The dialogue form enables him to continually ensure that the other person is with him in the process of opening up the facts of the matter, so that it prevents him from falling into empty speech that loses the object from view. Thus Gadamer's stated aim (1991: 52) in his analysis of Plato's *Philebus* is to show the elements of substantive scientific speech within the structure of coming to an understanding that follows from the character of the dialogue as conversation. He claims to detect the theme of coming to a shared substantive understanding as a leading one within the various forms taken by the problem of dialectic. In this way Gadamer hopes to provide a framework for his interpretation of the excursus on dialectic in the *Philebus* and thereby make the function of the excursus intelligible within the context of conversation. He claims that it will become evident that the dialectical power that is there discussed represents the dialectic that is proposed for discussion at the beginning of the *Philebus* because of needs arising within the discussion situation. Consequently, Gadamer insists that it is necessary to indicate which preconditions of the possibility of coming to a shared understanding are given along with the objective topics of the Socratic dialogues.

II. *Excursus on Dialectic in the* Philebus

As a test case for the hermeneutical versus the propositional approaches to Plato, I propose to examine the related discussions of methodology which are found near the beginning of the *Philebus*, and which have been interpreted differently by scholars from different traditions. Gadamer (1991: 112) finds a double danger in wanting to separate Plato's methodological expositions from their context for the purpose of giving a systematic interpretation of dialectic. First, one runs the risk of taking Plato's assertions about methodological issues to be the only measure of his actual consciousness of method in his work. Conversely, there is the danger of seeing the method he actually employs only in the light of his conceptual theory of method, instead of

illuminating the characteristic features and limits of his self-comprehension from the motives of his philosophical 'procedure', namely, reaching shared understanding through conversation in the form of a Socratic dialogue. For Gadamer, the special importance of the *Philebus* lies precisely in the fact that the dialectic that is discussed in it becomes aware of itself in the actual conduct of Socratic dialogue. Thus the theory of dialectic must be grasped on the basis of the concrete situation of coming to a shared understanding.

Let us begin from a later passage at *Philebus* 54b where Protarchus becomes a little impatient with Socrates for asking him the same old questions, and he wonders why Socrates does not answer them himself. Socrates seems to concede that there is no reason why he should not answer his own questions, except that he wants Protarchus to participate in the discussion (*tou logou summetochê*). Such an explanation may be understood in terms of the dramatic situation at the beginning (11a–b) of the dialogue where Protarchus has just taken over the *logos* from Philebus, in order to defend it against the contrary *logos*, i.e. that knowledge is the good. This *mise-en-scène* dictates a dialogical rather than a monological structure for the subsequent encounter, even if Socrates does take the lead in the conversation. However, Philebus himself refuses (12a) to engage in the dialectical contest between the *logoi*, while insisting that pleasure will always be the victor (*nikan*)—a paradoxical victory without any real contest! But Protarchus displays some independence of mind by replying to Philebus that he is no longer the master (*kurios*) of whether or not Protarchus shall agree with Socrates, since he has passed on the argument (*ton logon*) to him, as someone who is capable of participating in the dialogical contest. Protarchus later shows himself to be open to the kind of dialogical argumentation which Socrates typically conducts with a cooperative interlocutor who is willing to search for the truth.

But Protarchus baulks at certain points in the initial dialogue, e.g. at *Philebus* 13b where he resists the notion that any pleasures might be bad, and insists that all pleasures *qua* pleasures are good. Socrates characterises (13c) this as a regression to the same old argument (*ton auton logon*) that all pleasures are alike and do not differ from each other. Since this involves ignoring the significant examples in favour of differentiating pleasures, Socrates describes such verbal behaviour as being like that of worthless and inexperienced reasoners. Socrates supplies (13d–e) an illustration of agonistic and fruitless dialogue, e.g. if he were to imitate Protarchus and respond that what is utterly unlike is most completely like that which is most utterly unlike it. In this case, he can say the same things (*ta auta legein*) as Protarchus but both of them will be shown up as inexperienced and their argument (*logos*)

will be shipwrecked and lost. At this point (13d) Socrates applies the metaphor of navigating a ship to the proper conduct of a philosophical conversation, e.g.: 'Let us back her out (*anakrouometha*) and perhaps if we start fair again, we may come to an agreement (*allelois sunchoresaimen*)'.

This is immediately followed (13e) by Socrates' suggestion that the roles of questioner and answerer be reversed. But still he has to help Protarchus in formulating the question about the differentiation of knowledge, which is analogous to the question about the differentiation of pleasure. It will emerge that the forms of knowledge are many collectively and that some of them are unlike (*anomoioi*) each other. If some forms of knowledge should somehow turn out to be opposites (*enantiai*) then Socrates would not be worthy (*axios*) of engaging in dialectic (*tou dialegesthai*) if, through fear of that (i.e. self-contradiction), he should claim that no form of knowledge is unlike any other (as Protarchus has claimed for pleasure).

The consequences of such obduracy on either side of the debate are that the argument would vanish like a tale that is lost (*hôsper muthos apolomenos*). Protarchus responds (14a) appropriately by wishing to be saved from such ruin, and having being reassured about the equivalence between the two positions, is prepared to grant that pleasures are many and unlike (*anomoioi*), just as forms of knowledge are many and different. Socrates subsequently clarifies (14b) the rules of their dialectical engagement—there will be no concealment (*me apokruptomenoi*) of differences between goods, but rather it will be brought out into the open (*katatithentes eis to meson*). They will try to examine (*elenchomenoi*) whether pleasure or knowledge is the good, or some other third thing. The purpose of their controversy (*philoneikoumen*) is not to gain victory (*ta nikonta*) for one side or the other, but to fight together as allies (*summachein*) for the sake of the most perfect truth (*tôi alethestatôi*).

In the *Philebus*, according to Gadamer, the discussion of the problem of dialectic is motivated by the need for Socrates to explain to Protarchus that his stubborn appeal to the generic selfsameness of pleasure does not account for its manifold character, and so does not help to test its claim to be the good. Thus the theory of dialectic is used explicitly to ground the possibility of true dialogical progress towards a shared understanding. All knowledge and coming to a shared understanding requires a grasp of reality in 'what always is', so that Dasein is brought into the possibility of having disposition over it through knowledge. So, for instance, the claim of Protarchus that all pleasure is (generic) pleasure does not enable one to justify its claim to be the good, since there can be bad kinds of pleasure. His mistake was to move too quickly from the multiplicity of pleasures to their unity (13a3), thereby utilising the capacity of speech for turning the many into one, while losing touch with

reality. Such making of the many into one, and the one into many, is not the grasping of reality but the creation of confusion. Plato's language throughout this passage suggests that he is adopting an objectivist conception of truth, rather than a subjectivist or even an intersubjectivist conception.

According to Socrates, the trivial versions of the problem can be ignored since the serious problem of the One and the Many arises in the case of pure unities (unlike sensible things which are never pure unities), which are intelligible entities like 'man as such' or 'good as such', whereby a multiplicity of things are seen 'synoptically' together and grasped as one. Precisely as unities, they are the condition of the possibility of *dialegesthai* (conversation) in general (cf. *Parm.* 132a, 135c). The possibility of reaching a shared understanding about things that come to be and cease to be, depends on them being understood in a unitary way as always the same. Yet there is a real problem of how such unities can be many in the realm of coming to be (cf. *Phil.* 15b), e.g. how can the beautiful itself still remain unified, if it is supposed to be present in many things?

In her analysis of the so-called 'dialectical' part of the dialogue, Dorothea Frede (1993: xx) finds it *prima facie* unclear what the point of the long lecture (14b–20a)[8] is on the method of division because it does not lead to the result that one would expect. After the methodological discursus, Socrates suddenly declares that they can dispense with such a division, since the good of pleasure and knowledge can be determined in a simpler fashion (20b). Previous analytical commentators like Gisela Striker (1970: 9) took such apparent incoherence to indicate that Plato simply inserted a general excursus on the method of dialectic without bothering to integrate it into the dialogue. Perhaps Striker assumed that Plato's dialogue format is an unsuitable vehicle for what might be conveyed better in lecture format. Dorothea Frede (1992: 425–463), however, recognises the necessity of paying attention to the literary form of the dialogue in order to understand how form and content are related. She also acknowledges the importance of the *dramatis personae* for each dialogue and the distinctive roles which they play in the dialogical drama. For instance, the Socrates of the *Philebus* dialogue handles controversial moral issues in a new way.

The initial collapse of discussion with Philebus shows that philosophical debate can only be profitable if the partners are capable of engaging in thoughtful exchange, of questioning their own position, and of revising

[8] I find it very significant that she uses the term 'lecture' here, although she acknowledges that the dialogue is not a treatise.

self-serving tenets that cannot bear scrutiny. In contrast to earlier dialogues like the *Gorgias*, Socrates no longer seeks tactical victories over recalcitrant partners but rather passes over the unreformed hedonist to find a more promising partner, who can be converted from hedonism by rational persuasion. Although Protarchus initially digs in his heels, the confrontation never reaches breaking point and he remains cooperative, especially when Socrates shows willingness to compromise on his own advocacy of knowledge. This sets the tone for the subsequent inquiry, which is a joint enterprise in the search for the truth of the matter, rather than for victory. Ultimately, they reach a compromise solution to the question of the human good where neither pleasure nor knowledge emerges as outright winner.

With regard to the identity of Protarchus as 'son of Callias' (19b), Dorothea Frede (1996: 221) makes the fascinating suggestion that his real allegiance is to the sophist Gorgias, and that his sophistic training might explain why he is given an active role in the discussion. Thus, if Socrates manages to convert a disciple of the sophist Gorgias, then that can be seen as a major achievement. But how are we to reconcile this suggestion with the subsequent readiness of Protarchus to follow suggestions from Socrates? Frede claims (222) that this can be understood in terms of a new role for Socrates in *Philebus* as a 'sophist of noble lineage', according to *Sophist* 226a–231b. By distinguishing between refutation and testing, she defends her rather original claim against the potential objection that elenchus does not seem to feature very much in the *Philebus*. The 'sophist of noble lineage' not only frees the soul from false beliefs by refutation, but also provides a constructive kind of education (*paideia*) by sifting and sorting all the elements of the soul into a correct order. Frede argues (225) that such a cathartic kind of education is realised in the *Philebus*, when both parts are taken together. The right *paideia* that leads to happiness involves a full sifting and sorting among life's so-called goods, along with insight into the appropriate principles of choice; so that a correct and stable mixture may be found for a satisfactory human life.

Yet there is an unresolved interpretive problem as to how we are to make sense of Socrates' reference at *Philebus* 16c9–10 to the so-called 'divine method' which is held to be responsible for all technical discoveries (16c2), i.e. 'that those things which are always said to exist are composed of one and many, having Limit and Unlimited within themselves connaturally.' By way of clarification, Kenneth Sayre offers an elaborate reconstruction of the Platonic principles of the One and Indefinite Dyad, while drawing on other dialogues like the *Parmenides*, and on Aristotle's reports about Plato's 'unwritten doctrines'. But perhaps it would be better to look for other ways of explaining these references without appealing to Aristotle's conceptual

approach to the dialogues. Dorothea Frede (1993: xxv–vi) thinks that Plato is referring to the dialectical schema of collection into a generic unity, and subsequent division into species, which is familiar from the *Phaedrus*, *Sophist* and *Politicus*. She conjectures that the new terminology of Limit and Unlimitedness is intended to emphasise its novelty and rigour, i.e. in the demand for numerically exact subdivisions of the highest genus into species and subspecies until no further division is possible. When a numerically precise account of its members (i.e. limit) has been achieved, then one can allow an unlimited multitude of the many instances. This method is subsequently exemplified in terms of writing, and in terms of music.

But for my purposes here, the key point about Frede's interpretation of the role of Socrates in the *Philebus* is that she thinks that Plato is *not* representing him as a master dialectician who gives an authoritative account of this dialectical method. Instead, he is a doctor who cares for the soul of Protarchus by guiding him away from unreflective hedonism, using dialectical tools which are said to be gifts from the gods, or given in a dream. Thus, as Dorothea Frede argues (1996: 241), the 'digression' into the dialectical method is justified from a pedagogical point of view, since it paves the way for the hedonist's conversion. If *paideia* for the dialogue partner is the overall aim of the discussion, then Socrates' role as a teacher explains the limited responsibility he takes for the doctrines used in the educational process. For example, in shirking the task of performing a full-scale division, Socrates gives up any claim to possess an expert's mastery over the subject-matter. Dorothea Frede concludes that in the *Philebus* we do not have an abstract *Lehrgespräch* but rather a discussion that adjusts itself to the interlocutor's state of mind. The clear implication of this conclusion is that in other late dialogues there are more authoritative figures (like the Eleatic Stranger) who do give such a *Lehrgespräch*. Thus, just like Michael Frede, Dorothea Frede seems to assume that such an authoritative account would be more propositional than conversational in format, i.e. it could be a lecture instead of a dialogue. On the other hand, the dialogical approach of coming to an understanding with an interlocutor is less authoritative, though eminently suitable for pedagogical purposes.

Hermeneutically speaking, Dorothea Frede's clarification of the 'divine method' in terms of the immediate context within the *Philebus*, and in terms of other Platonic dialogues, is more satisfactory than Sayre's appeal to Aristotle's reports about an unwritten doctrine which he then reads back into the text of *Philebus*. But let us consider briefly the case made by Sayre, especially in view of Gadamer's own tendency to appeal to an Aristotelian conceptual account of Plato's views. In an introduction to his

second edition of a book on Plato's late ontology, Sayre (2005: x) talks a great deal about his attempt to understand Platonic dialogues in terms of the interplay between their logical and conversational structures. But he first (xi) appeals to Aristotle's report in *Metaphysics* I.6 about Plato's so-called 'unwritten doctrines', which Sayre summarises as follows: (1) that numbers come from the participation of the Great and Small in Unity; (2) that sensible objects are constituted by Forms, and the Great and the Small; (3) that Forms are composed of the Great and the Small and Unity; (4) that Forms themselves are numbers, and (5) that the Good is Unity.

The general assumption behind Sayre's interpretation is that there is no esoteric teaching within the Academy that Plato withheld from his dialogues, though he did talk philosophy with close associates like Aristotle who is therefore a reliable guide to his thoughts, which are also to be found hidden in late dialogues like the *Philebus*. Sayre claims that this hypothesis helps us to understand puzzling passages in that dialogue. For instance, Sayre (118) remarks on the puzzling character of the methodological reflections, especially the repeated reference to principles of Limit and Unlimited. With reference to the problem of the One and Many (*Philebus* 14c ff.), Sayre (2005: 119) interprets the text as speaking about two questions: (1) Whether we should accept the Forms as having genuine existence (*alêthôs ousas*); (2) Assuming a positive answer, how can a Form which does not change become involved with many changing particulars without losing its unity? Having identified the general problem about the unity of Forms, Socrates recommends the 'god-like method' which is responsible for making discoveries in any technical undertaking, and which is based on the assumption that things held to exist are always composed of one and many, having Limit and Unlimited within themselves connaturally (*en hautois sumphuton*—16c9). Sayre (120) suggests that this is almost equivalent to what Aristotle reports at *Metaphysics* 1004b32–34, when he says that Limit and Unlimited, as used by some thinkers as principles, can be reduced to unity and plurality. At *Metaphysics* 987a13–19, Aristotle substitutes unity for limit in opposition to the unlimited, and later (987b25–27) he claims that Plato agrees with the Pythagoreans except for making his Unlimited double—the Great and the Small—rather than a single principle.

Thus Sayre (120) defends the hypothesis that the Great and the Small, as reported by Aristotle, is identical with the Unlimited of Plato's *Philebus*. By way of support for this hypothesis, he claims that it provides a coherent interpretation of otherwise baffling passages in the dialogue, e.g. things that are composed of One and many (Limit and Unlimited, 16c9) can be

understood as constituted from Unity and the Great-and-Small, otherwise known as the Indefinite Dyad. Sayre (121) finds this entirely consonant with a pair of ontological theses, regarding Forms and sensible things, attributed to Plato by Aristotle, namely, that sensible things are constituted by the Forms and the Great and the Small and Unity. So, if the Forms are composed of the Dyad and Unity, and sensible things, in turn, are composed from Forms and the Dyad, it would be an intelligible abbreviation to say simply that both Forms and sensible things come from two basic principles.

In another work, however, Sayre (1995) claims that Plato wrote his dialogues (despite his criticisms of writing in general, or perhaps because he regarded written treatises as inadequate for philosophical pedagogy) in order to approximate to a living conversation between a master philosopher and a neophyte whose soul is being cultivated like a garden, so that it will eventually bear philosophical fruit by its own efforts. To support his interpretation, Sayre relies heavily on an interpretation of the *Seventh Letter*, along with passages from the *Phaedrus*, that give preference to philosophical conversation over writing. Sayre (11) finds no support in the *Seventh Letter* for the view that Plato reserved his mature philosophical thought for oral transmission to members of the Academy. But this does not mean that Sayre fails to take seriously the so-called 'unwritten teaching', since he tries to find evidence for it throughout the dialogues in an explicit manner.

The point that he extracts from the *Seventh Letter* is that language generally, both written and spoken, is inadequate for the expression of philosophical understanding. According to Sayre, Plato is not denying having himself written on philosophical subjects (which would be incredible anyway, given his own written dialogues), but rather he denies having attempted to put into writing an understanding of philosophy, which Dionysius did falsely claim. In other words, Plato is repudiating people who 'claim to know' (*phasin eidenai*, 341c2) about philosophy and who try to express in language what they think they know. Sayre claims that Plato denies ever having attempted to do such a thing himself, i.e. trying to express philosophic knowledge or understanding in linguistic form. For Sayre (12), 'The obvious consequence is that Plato's dialogues were not conceived by their author as contexts in which to develop and to display positive arguments for one or another thesis—at least not arguments of a sort that might communicate knowledge. To have attempted to communicate knowledge by discursive argument, in his view at least (341c4), would have been a sure sign of the lack of knowledge in question.'

Sayre's general thesis is that Platonic dialogues were written as teaching instruments through which author and reader might engage in conversation,

in the specific sense of *sunousia* that Plato cites (*Seventh Letter*) as a necessary part of the discipline aimed at the achievement of philosophic knowledge. Sayre (197) holds that instructional conversation like this played a major role in his own philosophical career in two ways: first, his own introduction to philosophy was probably due to interactions of this sort with Socrates; and secondly, the genre of the Socratic conversation provided the format for most of his written dialogues. Sayre describes as 'adventurous' his own suggestion that our relationship to Plato as readers of his dialogue is similar to his relationship with Socrates himself. If the Platonic dialogues were written as conversations to engage the attentive reader, this has consequences for how they ought to be read. Sayre sets out these consequences with specific reference to *Theaetetus* 197–198, which he regards as a good illustration of the relationship which Plato shared with the historical Socrates.

III. *Benign Hermeneutical Circles*

In this section I want to consider the possibility that Gadamer gives up the hermeneutical priority of the question, and consequently the primacy of dialogue, when he makes concessions to the so-called 'unwritten doctrine' which is so obviously a product of Aristotle's conceptual approach. Since it also implies that truth for Plato is objective and may be formulated in propositions (as outlined by Sayre), it seems to conflict with the intersubjective conception of truth that appears to be more appropriate to Gadamer's notion of conversation, according to which truth is an 'event of being' that happens to the interlocutors who become engaged with what is questionable in the subject-matter of their conversation. In *Truth and Method*, Gadamer sets up the model of Platonic dialectic as paradigmatic for the hermeneutic priority of the question. He insists that 'the openness of what is in question consists in the fact that the answer is not (yet) settled. It must still be undetermined, awaiting a decisive answer.' (363)

Posing a question implies openness but also limitation, i.e. the explicit establishment of presuppositions in terms of which one can see what still remains open. A question is put wrongly when it does not reach the state of openness but precludes reaching it by retaining false presuppositions. Insofar as a question remains open, it always includes both negative and positive judgments. According to Gadamer (364), this is the essential relation between question and knowledge. For it is the essence of knowledge not only to judge something correctly but, at the same time, to exclude what is wrong. Deciding a question is the path to knowledge. What decides a

question is the preponderance of reasons for the one and against the other possibility. But the thing itself is known in the full sense only when the counter-arguments are seen to be incorrect. In the context, Gadamer refers to the pro and contra format of medieval dialectic, which depends on the inner connection between knowledge and dialectic, i.e. question and answer.

However, in a chapter called 'The Dialectic of the Good in the *Philebus*', Gadamer (1986a) posed the following leading question: what relationship does the Platonic doctrine of Ideal numbers have to the Socratic question about *aretê* and the human good? And in another formulation: What was Plato thinking of in his famous lecture 'On the Good', when he took up the principles of the one and indeterminate two and then went on to talk about the human virtues? With reference to this, Gadamer underlines the importance of the *Philebus* dialogue where the Socratic question about the good in human life is actually posed again in such a way that the universal nature of the good is always kept in view, i.e. the latter question is completely woven into the plot of the discussion about the respective importance to human life of *hêdonê* and *phronêsis*. The question posed in the *Republic* (505b)—whether pleasure or thinking is the highest good—is made the theme of a dramatic confrontation in the *Philebus* between Philebus and Socrates as advocates.

What emerges in the subsequent discussion, however, is that the good life must consist in a third thing, a mixed genus in which (unlimited) *hêdonê* and reason (*nous*) as the source of measured restraint are both found. The mixing is not a product of *technê* but rather of human choice, since we are the mixture of our drives and our intelligence. Plato reveals this through the way he has Socrates insist that the question be put to both pleasure and knowing, how far each will accept the other. Even if one grasps the mixture metaphor as an image of real human self-knowledge, the question about the normative role of the good in the mixture remains. So we cannot escape having to articulate conceptually what we call good in regard to our concrete human existence. From this perspective, Gadamer thinks (112) we can see the actual meaning of the mysterious doctrine of the four genera. It is more than the Pythagorean doctrine of the *peras* and *apeiron* because Plato distinguishes between the noetic world of numbers and what is given in concrete appearances—the latter he calls 'genesis', and it is not another form of ideal being but rather the real being of what comes to be. This is the genus of things mixed from the *peras* and *apeiron*, i.e. the third mixed genus. Not only *hêdonê* and *lupê* appear in this mixed genus but also the good of human life (*Phil.* 61b)—this is also the good in the *polis* and in the cosmos

(31b). Thus, Gadamer claims (113), the doctrine of the four genera proves to be both the ontological preparation for and prerequisite for the debate in the *Philebus*.

Gadamer remarks (114) that the discussion of the four genera is a universal ontological doctrine that embraces the whole cosmos and its constitution. In all his dialogues this is the closest Plato comes to Aristotle's parallel account of the two principles, the one and indeterminate duality. One can even see how Plato might have developed a physics, as an eidetic science of what is in essence coming-into-being (*gegenêmenê eis ousian*). Physics and ethics can be treated here, undifferentiated from each other, as mere applications of the basic ontological structure of the good. By contrast with Aristotle's technique of conceptualisation, the mode of discourse used by Plato may be described as 'mythical', e.g. the Demiurge as craftsman of world-order, or *nous* as cause of the right mixture that constitutes a good human life. However, Gadamer suggests (115) that Aristotle's physics and ethics achieved a translation of these mythical metaphors into concepts.

So what is the crux of my difficulty with Gadamer's hermeneutical approach to Plato? In his own words, it centres on truth and method. On the one hand, there is his notion of truth as 'an event of being' and, on the other hand, his denial of the possibility of any methodical procedure for achieving truth. This can be taken to mean that any conceptual formulation of Platonic doctrine, either in propositional format or even as principles of an unwritten doctrine, represents at best a flattening into one dimension of the three-dimensional oral conversation, or at worst a plain falsification of the Platonic approach to philosophical activity. Thus Gadamer seems to betray his own hermeneutical approach to Plato's dialogues when he concedes that some deep ontological principles, such as those reported to belong to the unwritten doctrines, are underpinning the dialogical game. On the other hand, however, a lot may depend on the truth status of these principles or propositions, i.e. whether they are objective truths, or merely subjective, or even intersubjective, as Davidson suggests.

Gadamer rejects the correspondence theory of truth, according to which propositions are true if and only if they correspond with some independently accessible reality, while advocating the Heideggerian notion of truth as unconcealment according to which truth emerges through the activity of dialogue, as something that happens to the dialogue partners when they engage deeply in conversation about some subject-matter. But the superficial resemblance to Davidson's intersubjectivist account of truth may prove misleading, especially as Gadamer underlines the manner in which the subject-matter of the text controls the attention of the dialogue partners

and provides direction for their shared inquiry. Yet it remains unclear to me whether he can consistently espouse an 'objectivist-participation' conception of truth such as Christopher Gill (1996: 284) ascribes to most classical authors, especially Plato and Aristotle.

Conclusion

In this paper I have explored the implications of the Gadamerian model of conversation as a hermeneutical tool for reading Plato's *Philebus*, while comparing it with alternative models of interpretation offered by analytical scholars who also take seriously the literary format of a Platonic dialogue. Such issues are now part of the *status quaestionis* in Platonic scholarship, although some scholars like Irwin and Fine still focus exclusively on the argument of the dialogues, as if Plato had written philosophical treatises. However, even among scholars who pay close attention to literary form, many like Sayre are convinced that Plato held definite philosophical views which he wished to communicate to his readers in a way that best approximated to his oral communications within the Academy. But if Plato's purpose had been simply to communicate his dogmatic philosophical views, there would be no overriding reason to prefer dialogues over monologues like his infamous lecture 'On the Good'.

Analytical scholars such as Michael Frede think that Plato's preference for the dialogical format can be explained in terms of an unwillingness to confer authority on the utterances put into the mouths of the interlocutors. But one of the hidden implications of this explanation is that if Plato wished to speak like a divine authority, then he would have chosen the monological format, since the dialogue is merely a second-best or human form for communicating the truth. If this were the case, however, one might expect Plato to have written philosophical treatises that set out his doctrines in propositional format. This is perhaps the expectation that motivates those who search for Plato's 'unwritten doctrines' either within the dialogues or in Aristotle's reports.

By contrast, Gadamer's emphasis upon the primacy of the question, and hence upon dialogical conversation as the paradigmatic expression of Plato's philosophy, implies that the dialogues should not be read as mere vehicles for determinate doctrines that might be better formulated in terms of propositions. Therefore, it is quite misleading for Gadamer himself to appropriate the so-called unwritten doctrines by explaining them as products of Aristotle's conceptual flattening of the three-dimensional living philosophy

embodied in dialogue. For me this is also an indication of an unresolved problem on Gadamer's part concerning the truth claims of such Platonic philosophy, i.e. whether they have the objective-participant status that is typical of Greek philosophy, or the intersubjective status that is typical of modern philosophy, as advocated by Davidson.

It is clear to me (and for this insight I am indebted to Gadamer) that Plato's dialogues should not be treated as mere vehicles for philosophical argumentation, like the dialogues of George Berkeley (who once graced Trinity College Dublin with his presence, while also keeping an eye on the trees in the quad). In fact, they are exemplifications of philosophical activity, not only by the interlocutors who appear in them but also by the audiences, whether ancient or modern, who are invited to participate in the conversation by thinking through the problems raised and by testing any solutions for adequacy. The experience of reading a Platonic dialogue is akin to that of overhearing a fascinating conversation and of silently engaging with the issues through that internal dialogue which Plato calls thinking.

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INDEX OF MODERN AUTHORS

Ackrill, J.L., 274
Adalier, G., 421n
Albritton, R., 372n87
Annas, J., 8n14, 160n10, 194n20, 195n21, 315n, 422, 423, 432, 435, 452
Apelt, O., 486n24 & 25
Apostle, H.G., 305, 322, 325n30, 498, 503n71
Ast, T., 306n10, 337n16, 344n35, 352n52
Aubenque, P., 321n25, 484n16

Bäck, A., 192n18
Balme, D.M., 387n11 & 12
Baltes, M., 5n3, 525n, 529n11
Baltzly, D., 91n17
Barford, R., 333n1, 345n37, 346, 347
Barker, A., 469
Barnes, J., 182, 194n20, 195n21, 304n, 308n13, 358n63, 359, 368n83, 406, 407, 409, 486n25
Bechler, Z., 252, 261n
Beierwaltes, W., 544n3, 545n7
Benacerraf, P., 415n2
Berti, E., 409n
Beutler, R., 556
Blair, G., 259–266
Blyth, D., 423, 424n18
Bolton, R., 348n41, 399n, 401n34, 480n4, 491n38
Bonitz, H., 344n35
Bostock, D., 148
Brandwood, L., 306n10, 337n16, 344n35, 352n52
Broadie, S., 148
Brown, M., 349n43
Burkert, W., 164n22
Burnyeat, M., 122n23, 132n2, 140, 145, 206, 415, 420n, 504n75, 506n

Calvert, B., 261n
Cantor, G., 417n8, 418
Charles, D., 124n26
Charlton, W., 122n24, 484n18, 496n58
Chen, C.-H., 487n29
Cherniss, H., 8n14, 13, 14, 16, 333n2, 345n37, 415, 416, 419n11, 422n16, 447
Chroust, A.-H., 335n7
Claghorn, G.S., 447n6
Code, A., 363n74, 372n87, 373n91
Cooper, J., 117n14, 350n46
Cornford, F.M., 4, 7n6, 168n32, 169n33, 421n
Coulter, J.A., 5n2
Cousin, D.R., 486n24
Crubellier, M., 455n

Davidson, D., 566, 581, 583
Davies, J.K., 476n14
Décarie, V., 486n24, 486n25
Denniston, J.D., 349n43, 486n25
De Koninck, C., 301n2, 308n14, 313n19, 325n29
De Vogel, C.J., 335n6
Dicks, D.R., 170n37
Dihle, A., 116n13
Diller, H., 381n4
Dillon, J., 5, 7n9, 11, 12, 143n, 533n, 538n22
Di Napoli, G., 486n24
Dodds, E.R., 550, 552–557
Dover, K.J., 55
Driscoll, J., 372n87, 373n92
Düring, K., 334n5, 335n6

Elders, L., 318, 461n

Ferejohn, M.T., 490n36
Findlay, J.N., 418n, 422n17, 443, 444
Fine, G., 333n1, 339n20 & 21, 350n46, 351n48, 354n56–58, 483n15, 487n28, 488n30, 494n51, 502n70, 582
Fowler, D.H., 10n19, 438n25
Frank, D.H., 333n2, 334n4 & 5, 337n17, 338n18, 339n22, 341n27, 342n30, 343n32, 345n36, 350n46, 352n51
Frede, D., 574–576
Frede, M., 453n, 499n63, 500n, 566, 582
Freeland, C., 389n13
Frege, G., 195n23, 198, 199, 305n9, 315n, 433, 435, 436, 438

Gadamer, H.-G., 3, 5, 7, 17, 73n, 116n10, 158n4, 332n, 333n3, 338n19, 339n21, 367n81, 483n13, 559n, 565–583 *passim*
Gaiser, K., 422n17

Geach, P.T., 348n42
Gersh, S.E., 210n
Gill, C., 582
Gill, C., 566n
Gill, M.L., 272, 275
Gohlke, P., 308n14, 313n19
Graham, D., 261, 305n8
Griffith, M., 21n6
Grondin, J., 568n5
Guthrie, W.K.C., 13, 170n36, 172n41, 317, 319

Haas, F.A. de, 194n20
Hackforth, R., 155n
Halper, E., 462n18, 480n6, 486n24
Hambruch, E., 306n11
Happ, H., 305n8, 447n, 486n25, 487n27, 494n49
Hare, J.E., 483n14
Harte, V., 420n
Hartmann, N., 203n4
Havelock, E.A., 20n
Heath, T.L., 188n11 & 12, 385
Hegel, G.W.F., 543–561
Heidegger, M., 82n6, 318n, 495n54, 567, 569, 570
Heinaman, R., 271n26, 363n74, 370n85, 372n88
Heinze, R., 11n22
Hicks, R.D., 324n, 325n30
Hussey, E., 194n20, 195n21, 434

Ifrah, G., 417n6
Irwin, T., 117n16, 122n23, 347n40, 379, 384n, 386n, 387, 390n18, 392n23, 394, 397n27, 398–404, 407–409, 413, 414, 469, 486n24, 565n2, 582

Jaeger, W., 21n6, 29, 38, 73n, 105n7, 333n3, 334, 335, 466n, 479, 485n21, 486n24

Kahn, C.H., 58n4, 339, 340, 348n40
Kapp, E., 385n
Keyt, D., 163n20, 467
Kirwan, C., 486n23, 489n33
Klein, J., 341n28, 419, 420
Knorr, W.R., 188n12
Kosman, A., 270–272, 508
Kranz, W., 381n3
Kullmann, W., 387n12

Lachterman, D., 14n30, 188n12
Lasserre, F., 354n59, 382n6
Lear, J., 66n6, 194n20, 198, 316n
Ledger, G.R., 8n12
Lennox, J., 497n61
Lernould, A., 527n6, 529, 538n22, 541
Lesher, J.H., 372n88, 373n92
Leszl, W., 358n63, 389n14, 391n20
Lloyd, A.C., 350n47, 354n58, 544n3, 546n9, 553n14
Lowry, J.M.P., 544n3, 549n

MacDowell, D.M., 465n2
Madigan, A., 343n34, 448, 449
Mansion, A., 301, 308n14, 313n19, 325n29, 484n19
Mansion, S., 482n11
Marrou, H.I., 21n6, 29n14
McCabe, M.M., 566n
McKay, R., 501n65
Mendell, H., 434
Menn, S., 255, 258n21, 263
Merlan, P., 422n17, 479, 486n23 & 25, 487n27, 495n52
Mignucci, M., 194n20, 435, 436
Miller, F.D., 469, 473
Mittelstrass, J., 157n, 160n12, 171n38 & 39, 381n3
Modrak, D., 194n20, 491n39
Mohr, R., 162n17, 163n20, 173n44
Monan, J.D., 400n
Morrison, D., 305n6, 311n16, 483n15, 488n30
Morrow, G.R., 212n, 548n
Moukanos, D.D., 190n16
Mueller, I., 182, 194n20, 202, 207n, 208n12, 210, 212n, 447, 484n18
Mulgan, R.G., 471
Mure, G.R.G., 304, 355n60

Nehamas, A., 341n27
Netz, R., 198n27
Neugebauer, O., 381
Nikulin, D., 214n
Nussbaum, M., 117n14, 313n18, 398, 399

O'Meara, D.J., 549, 550n
Oehler, K., 119n19
Osborne, C., 58n3
Owen, G.E.L., 8n12, 159n8, 169n33, 321n26, 333, 345n37, 347, 360n, 386n, 398, 399, 462n17
Owens, J., 308n14, 481n5, 482n11, 486n24

Parente, M.I., 335n9
Parry, R., 163n20, 232n
Patterson, R., 163n20, 351n49
Patzig, G., 499n63, 500n
Philip, J.A., 503n73
Philippe, M.-D., 301
Pohle, W., 229n8
Popper, K.R., 229n8
Prior, W.J., 161n15, 162n17, 163n20, 168n32, 348n41
Pritchard, P., 415, 415n2

Reeve, C.D.C., 92n19
Rist, J., 480n5, 482n11
Robin, L., 422n17
Robinson, R., 160n12
Robinson, T.M., 4, 7n9, 8n13, 29, 33, 158n5, 159n9, 173n44
Romilly, J. de, 19n1
Roochnik, D., 565n2
Rosen, S., 261n
Ross, W.D., 270, 322, 350n45, 367, 370, 434, 443n, 479n, 480n7, 481, 485n20 & 21, 486n24 & 25, 493, 495n52, 496, 497, 500n
Rowe, C., 3, 54, 63, 333n1, 345n37, 466n
Runia, D., 528n8 & 10
Russell, B., 198, 201n

Saunders, T.J., 234n
Sayre, K., 575, 577–579, 582
Scaltsas, T., 119n19
Schiaparelli, G.V., 381
Schofield, M., 186n7
Schulz, D.J., 231n11
Schwegler, A., 479, 482n12, 485n20 & 21, 486n24 & 25, 487, 487n29
Sedley, D., 226n3
Sherman, N., 145
Shorey, P., 89n12, 91n18, 169n33, 233
Skemp, J.B., 166n26, 381n3, 389n15
Smith, J.A., 370n84
Smith, N.D., 476n13
Solmsen, F., 395n
Sparshott, F., 132n4
Steel, C., 515n4, 519n12, 526n5
Stocks, J.L., 317
Stone, M.A., 274
Strawson, P.F., 196n26
Striker, G., 574
Szabo, A., 164n22, 169n35

Tarán, L., 15n31, 169n35, 415
Taylor, A.E., 7n6, 160n12, 169n34, 177n46
Taylor, C.C.W., 470
Thomas, R., 37n1
Tigerstedt, E.N., 5n4
Tod, M., 417n6
Tredennick, H., 304n
Trépanier, E.T., 486n24
Trouillard, J., 518n10
Turnbull, R.G., 401n34

Van der Waerden, B.L., 164n22, 170n36
Versényi, L., 19n3
Vlastos, G., 6n, 8n11, 9n15 & 16, 10n20, 115n, 116n10, 119n19, 159n7, 160n11 & 13, 172n42, 230n9 & 10, 340n26, 419n11, 565n2
Von Fritz, K., 401n33

Wedberg, A., 416n4, 422n17
White, M.J., 274
Whittaker, J., 7n9, 158n5, 538n22, 554
Wians, W., 182
Wieland, W., 112n3, 494n50
Woods, M., 372n87, 373n92
Wörner, M., 488n31
Wundt, M., 486n24

Yunis, H., 38n4

Zekl, H.G., 486n24
Zeyl, D., 158n5